

# COMPUTERWORLD

\$2.00 A COPY; \$44/YEAR

SEPTEMBER 17, 1984

VOL. XVIII, NO. 38



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## IBM System/38 additions boost performance 70%

RYE BROOK, N.Y. — IBM last week unveiled two high-end models for its System/38 line, said to provide up to 70% more internal performance and twice the memory capacity of previous models.

The System/38 Models 20 and 40 will be available in December, IBM said.

The Model 40 is said to provide 70% more internal performance and two times more memory — up to 16M bytes — than the previous top-of-the-line Model 8, while the Model 20 is said to have 30% greater performance than the Model 8.

The Model 20 is available with 4M, 6M or 8M bytes of memory, and the Model 40 is available with 8M, 12M or 16M bytes of memory. Term leases are said to be available for the two models.

The Model 40's processing unit has a minimum instruction cycle time of 67 nsec, a main storage internal cycle time of 333 nsec per 4 bytes and control storage capacity of 12K 32-bit words. The Model 20 has a minimum instruction cycle time of 67 nsec, a main storage internal cycle time of 400 nsec per 4 bytes and control storage capacity of 12K 32-bit words, the company said.

Both models can accommodate the following peripherals: up to eight 3370 Disk Storage Attachments and a maximum external direct-access stor-

See IBM page 4

In addition to the System/38 model debuts, IBM unwrapped a multitude of other products last week, spanning the spectrum of high-end and low-end hardware and communications. Page 4.

## MIS hardware outlays up, reversing decade-long trend

By Charles Babcock  
CW New York Bureau

NEW YORK — For the first time in a decade, MIS departments are spending more instead of less on hardware, according to a survey by the Diebold Group, Inc. based here.

Until this year, hardware's share of the MIS budget had been declining steadily. It fell to a low of 27% in 1983, but this year is up to 29%, roughly matching the amount MIS departments spend on personnel, said David J. Dell, director of Diebold Research Services, during a presentation of the survey's findings here last week.

Overall, MIS budgets increased an average of 13.6% in 1984, about the same gain that they have maintained for several years. But they did so at a time when other corporate departments were being trimmed back, so MIS represents a greater share of corporate revenues, Dell said.

Instead of accounting for 1% of revenues as in recent years, MIS has made "a very dramatic jump" to 1.4%. One reason is that projected 1984 revenues still reflect the cautious outlook of corporate planners as the recovery took hold, Dell said.

"Revenue growth will bring MIS back down, but the ante has been raised. An effort is being made to raise

productivity through MIS," he said.

The Diebold Group, a management consultant firm, surveys North American corporations on information processing twice a year. About 155 companies, spending an average of \$31 million a year on MIS, responded in the latest survey.

Though the average MIS budget increase of \$3.6 million was typical of previous years, it still left MIS directors with more money to spend on hardware, he said. "For the first time, the bulk of the increase did not go to personnel and inflation," Dell said. With an average \$406,800 increase to spend on hardware, MIS departments used the extra

*The overall MIS budget reflects the growing use of independent software houses.*

dollars in the following ways:

■ Minicomputers took the largest share of the increase, at 35%. "Weren't minicomputers supposed to be a dying breed? Minicomputer growth sort of jumped off the page," Dell said. They are being used for computer-aided design and manufacturing and for computer graphics, giving them a significant niche as single-purpose devices, the survey showed.

■ End-user equipment, primarily personal computers, took the next largest piece of the increase, at 21.3%. Dell said he was surprised that the figure was not higher, but MIS directors

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## A CLOSER LOOK

### Phone/micro offerings: How useful?

By Eric Bender  
CW Staff

Advertised as "the next evolutionary step" or "the other half of the personal computer," a flurry of products adding voice and data communications features to personal computers has hit the streets in recent months.

But what do these jazzy new systems do that cannot be done by a personal computer equipped with a garden-variety modem, communications software and a standard telephone?

The devices will save "tremendous amounts of time" for professionals whose work depends heavily on communications, declared Charles Fosskett, president of Natural Microsystems Corp. in Natick, Mass. His company's Watson product, introduced this month, adds voice mail and voice processing to standard telephone and data functions.

"I can easily save half an hour to an hour a day," said Federico Faggin, president of Cygnet Technologies, Inc. in Sun-

nyvale, Calif., whose Communications Cosystem peripheral for the IBM Personal Computer first shipped last December. "In general, the Cosystem should reduce communications costs. The other thing is that you save time and energy for support people; for example, in our company, we don't have secretaries."

Steven Fields, vice-president for product development at Wilcom, Inc. in Roswell, Ga., listed a string of benefits for his company's Asher, delivered in June. Among them is the integration of computer operation with a telephone data base

so users do not have to look up each number manually. Users also can switch from voice to data transmission and back again or transmit a portion of the screen showing a Lotus Development Corp. 1-2-3 spreadsheet, Fields said.

However, analyst Stephen Caswell of Trigon Systems Group in Toronto said his early enchantment with the Cosystem and similar systems has faded considerably.

See VOICE page 8

## TOP OF THE NEWS

Digital Equipment Corp. and Sperry Corp. each announced micro additions to their product lineups, DEC unveiling a high-end Professional, while Sperry rolled out its first portable. Page 6.

It is not illegal to wiretap digital transmissions, a loophole a U.S. senator is trying to close with legislation. Page 6.

And the winner is... Political scientists dabbling with regression analysis models are putting their money on President Reagan to top the ballot in November. Page 9.



Harris Corp. embraced AT&T's Unix with the announcement of a phased implementation of the operating system across its entire supermini line. Page 13.

Help from afar. As many as 200 Chinese computer scientists and programmers will work for U.S. companies — for a lot less than what their U.S. counterparts are paid — as part of a unique business venture. Page 17.

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NEWSPAPER

## NEWS

# Increased work load seen offsetting MIS budget rise

By Charles Babcock  
CWI New York Bureau

NEW YORK — Although MIS budgets claimed an increasing share of corporate revenues in 1984, the increase "didn't match the sharp increases in work load most companies are demanding from their information resources," the Diebold Group, Inc. said.

Diebold based its claims and observations on its recently released MIS budget survey of Fortune 500 companies (see story page 1).

To cope with the growing demands, the MIS department "is beginning to reposition itself as the provider of a variety of computing options for the organization," the study claimed.

The leading companies are beginning to allocate money for computing outside the data center and to "[spread] greatly the responsibility for the operation and maintenance as well as use of information resources," the study said.

One way of dispersing this MIS responsibility is through information centers, Diebold said. Eighty percent of 155 firms responding to the latest Diebold questionnaire stated they have established the centers, compared with 67% a year ago. Through information centers, MIS directors

now hope to accomplish 10% of the programming work load by end users, the survey found.

And by the end of the decade, end-user computing may constitute the dominant means of providing information support in major corporations, Theodore J. Freiser, president of John Diebold & Associates, said during a presentation of the survey results last week.

This decentralization will "literally reverse the ground rules which governed the way MIS activity has been organized and managed," Freiser stated, but other Diebold researchers said obstacles remain in the path. For one thing, MIS staffs are not growing at the same rate as the demands placed upon them. Staff head count grew by only 4.8% in 1984, compared with 10% in 1982 and 1983. Twenty-five percent of the respondents in the survey reported either no growth or a decline in staff between 1983 and 1984. "Growth in personnel is limited to applications programmers and telecommunications staff, and significant numbers of those are expected to be outside the MIS budget," said Donna Tarbania, researcher with Diebold Research Services.

An equally significant obstacle may prove to be the "weight of the past" or entrenched atti-

tudes of MIS staff members used to having other departments line up for information processing services, Tarbania said.

MIS staff turnover has dropped to 5.6% this year, compared with 16% in 1981. This means companies are going to have to "bring people along" on the new, decentralized approach when they may prefer to continue the old, "control-oriented," we are the keepers of corporate information" way of doing things.

MIS management is under pressure to increase output without adding many people, and there are a number of ways they are likely to be able to do so, she noted.

They include:

- Greater reliance on purchased software rather than in-house software.

- Accepting, "and in some cases, abetting," the shift in work load to end users through decentralized computing, personal computers and the information center.

- Making use of greater automation in standard computer operations.

- Adopting advanced systems development methods. A company could adopt "a real aggressive use of code modules."

## MIS from page 1

reported that an equal amount was probably spent "off-budget" by other departments, which accounted for their purchases under headings such as "research aids" or "calculators."

- Peripheral devices took 20.3% of the increase; communications devices, 14%; and central processors and memory, 9.3%.

In the overall MIS budget, software and office automation expenditures showed the biggest gains. Software spending showed a 30% increase over 1983 and accounted for 5% of the MIS budget. The change reflects the growing use of independent software houses and a shift away from reliance on the equipment manufacturer or in-house programming, Dell said.

Office automation within the MIS budget increased nearly 50% over last year, showing both better accounting for office automation expenditures within the MIS budget and a dramatic increase in end-user computing, he said.

The survey is available to Diebold clients. Additional information can be obtained from the Diebold Group, which is located at 475 Park Ave. S., New York, N.Y. 10016.

## Wanted: News

Hard as we try to give our readers the most complete information available, some good news and feature stories never reach us.

Are you involved in an unusual application of DP technology in your company? Have you implemented successful cost-cutting strategies? Know any unsung heroes? Any news about vendors?

If so, we'd like to hear from you. *Computerworld* has established a reader hot line for information regarding items of interest to the computing community. Call us toll free at (800) 343-6474. Ask for Donovan White, assistant managing editor.

We can't be everywhere — but our readers are.

## CORRECTIONS

Due to incorrect information supplied to the reporter, the article "MDS Qantel loses second multimillion-dollar fraud suit" [CW, Sept. 10] inaccurately said that Datapro Corp. is defunct and that its principal stockholder, Wilhelm Kast, also owns DP Corporate Services, Inc. Kast reports that he is neither an officer or stockholder in DP Corporate Services and that Datapro remains active as a consulting firm and software developer.

In *Computerworld's* Aug. 20 Hardware Roundup, a footnote on the National Advanced Systems, Inc. (NAS) chart incorrectly identified the supplier of a vector processor option for NAS' AS/9000 series processors. NAS provides the vector processor option.

In "System helps credit union save time" [CW, Aug. 27], the Ultimate Corp. Model 2000S system has a 154K-byte disk drive.

The article "French ADI chartered to promote computers" [CW, Sept. 3] was inadvertently attributed to Jo Cohen, news editor of *Le Monde Informatique*, our sister publication in France. The story was actually written by Luc Sala, a Netherlands-based contributor to *Computerworld*.

## NEWS SUMMARY

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business 24 hours a day/23

At Yellowstone and other national parks, officials are using a computer to track the movements of bears/24

The U.S. Air Force announced that the vacuum-tube radar sets used in its Distant Early Warning System will be replaced/26

During a recent interview, Brazil's Secretary of the Special Department of Informatics blamed his government for the current problems of Cobra, a state-run computer maker on the brink of fiscal disaster/30

A nationwide courier's mini-based dispatch system has cut the time it takes for a telephone order to reach a dispatcher/32

DP tools are affecting productivity and cost-effectiveness at an electrical wiring device manufacturing firm/36

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## NEWS

## IBM adds low-end model to 4361 line

RYE BROOK, N.Y. — IBM last week unveiled a low-end addition to its 4361 series, the Model 3, while canceling the 4321 and 4331 series of mainframes. At the same time, IBM announced 10% price cuts for two existing models in the 4361 series and cuts of 21% to 37% in the prices of the discontinued series' processors.

The commercial performance of the Model 3, which is also aimed at science and engineering applications, is said to be equivalent to that of the 4331 Model 2, and its number-crunching performance is said to be 2.2 times that of the Model 2. The Model 3 is available with 2M to 4M bytes of main memory, up to three data channels, integrated I/O attachments and standard System 370 I/O interface channels, IBM said.

Programming support for the Model 3 includes VM/SP, SSX/VSE, VSE/SP and OS/VS1, IBM said. The direct sharing of information between intelligent workstations connected to a 4361 host is made possible through Decision Support/VSE programs, as well as through an updated version of the Small Systems Executive operating system.

Standard features for all 4361s will now include a serial OEM interface for attachment of non-IBM intelligent workstations, subsystems and other devices, the company said. Optional features available for 4361s now include a Workstation Adapter, said to allow up to 32 terminals and intelligent workstations to be attached via the 3299 terminal

multiplexer, and an autostart feature, said to start a processor by remote control at predetermined times. The autostart feature will be available in April 1985, and the Workstation Adapter will be available in December, the company said.

The price for a Model 3, available in December, is \$56,500 with 2M bytes of main memory, diskette drive and display/printer adapter. The Model 3 can be field-upgraded to Models 4 and 5 as of October 1985.

With price reductions, the Model 4 now costs \$135,000; Model 5, \$180,000; and the 4321, \$48,000; the 4331 ranges in price from \$41,705 to \$79,920. IBM said it will stop taking orders on the 4321 and 4331 systems on Dec. 31.

Term leases are now available for the 4321, 4331 and 4361 models through the IBM Credit Corp., the company said. The Workstation Adapter feature costs \$7,500; the autostart feature, \$1,200; and a Floating-Point Multiply Accelerator, which is standard on the 4361 Models 4 and 5, costs \$8,500 on the Model 3, IBM said.

In a related software announcement for the 4361s, IBM announced it is marketing a computer-aided design and manufacturing package from Cadam, Inc., called Cadam Express. The package carries a one-time license fee of \$126,000.

More information on the 4361 products is available from IBM Information Systems Group, 900 King St., Rye Brook, N.Y. 10573.

## IBM from page 1

age device capacity of 5.8G bytes; up to 128 local workstations, including IBM Personal Computers via the Work Station Controller-Extended; up to 12 communications lines with multiple devices; one or two adapter-attached line printers; and tape I/O through IBM 3410/3411 tape unit and control and/or IBM 3430 magnetic tape subsystem. The Models 20 and 40 operate under control of the System/38 Control Program Facility Release 6.0, according to IBM.

### Technological advances

Technological advances in Models 20 and 40, called the Extended Model Series, are said to provide greater internal performance and more memory capacity in the same physical space as the system unit in existing models.

IBM said the enhancements were made possible by increased use of high-speed bipolar technology, said to reduce cycle time, balance performance and extend addressing capability. Also, the Model 20 and 40 multichip logic module is said to combine four chips in one module for greater processing power.

The price of a Model 20 with 6M bytes of main memory and one disk drive is \$175,000, according to IBM.

The price of a Model 40 with 12M bytes and one disk drive is \$250,000.

Further information is available from IBM Information Systems Group, 900 King St., Rye Brook, N.Y. 10573.

## IBM network offerings target lower cost, greater flexibility

RYE BROOK, N.Y. — In a flurry of announcements made last week, IBM introduced several communications products and product enhancements aimed at reducing networking costs while providing new alternatives.

Included in the bundled introduction were: an ASCII device controller; a network controller that provides concentration functions; enhancements to the IBM 3725 front-end processor; Systems Network Architecture (SNA) software enhancements, including extended addressing; a new version of the Distributed System Executive that enables support and management of remote IBM System/360s; and new voice and text messaging capabilities.

The new IBM 7171 ASCII Device Attachment Control Unit attaches locally to 4300 and 30 series processors through a block multiplexed channel — appearing to the host as one or two 3274 Model D cluster controllers — providing 3270 emulation to full duplex ASCII terminals.

Attached devices, which appear to the host as 3278 displays, can thus gain access to host applications such as CICS, IMS and TSO on MVS or MVS/XA systems. Available in the fourth quarter of 1984, a 16-port model, expandable to 64 ports in eight-port increments, costs \$12,420.

Other telecommunications-related announcements were said to "provide greater network design flexibility and offer potential for reduction in network costs while improving network performance." They include:

■ The 3710 Network Controller, said to concentrate Synchronous Data Link Control (SDLC), start/stop and bisynchronous protocols over a single SNA/SDLC or X.25 link to a remote host. Supported as if it were a controller within SNA, the 3710 can connect to one or more 3705 or 3725 front-end processors through separate links.

The controller provides support for up to 32 devices, which are connected through V.24, V.35 and X.21 interfaces at speeds ranging from 110 bit/sec to 64K bit/sec. The maximum link speed between the 3710 and a remote host is 64K bit/sec. Available in the second quarter of 1985, the base model costs \$20,300.

■ Enhancements for the 3725 Communications Controller Model 2 include expanded maximum memory support from 512K bytes to 2M bytes, expanded line support from 24 medium speed lines to 80 and the doubling of channel adapter features that can be supported from two to four. Other enhancements include a high-speed adapter that enables support of lines operating at speeds up to 1.54M bit/sec and a new clock feature that provides for the support of asynchronous lines to 19.2K bit/sec and direct attachment of synchronous devices at 245,760 bit/sec. A base machine costs \$60,000.

SNA software enhancements were multifaceted. Perhaps most significantly, they included new versions of ACF/Vtam (Version 3) and ACF/NCP (Version 4) and related programs that expand the number of devices that can be addressed within SNA. With the enhancements, up to 255 subareas can be identified per network, with 32,000 elements in each subarea, enabling more than eight million logical units to be addressed.

The new version of Vtam, in conjunction with other enhanced programs, also is said to relieve the virtual storage constraints for MVS/XA. Now applications under MVS/XA can use 31-bit addressing to communicate with ACF/Vtam through the application program interface, IBM said.

The new Vtam version will be available in the second quarter of 1985 for an initial license fee of \$5,850 and a monthly fee of \$1,950. ACF/NCP Version 4, which is scheduled to be available in the third quarter

of 1985, will cost \$1,950 initially and carry a monthly charge of \$650.

Other SNA-related announcements included the introduction of Version 3 of ACF/Team, which is said to enable Team applications to take advantage of Vtam facilities; and enhancements for Network Management Products, including Release 2 of the third version of the Network Problem Determination Application that is said to provide new menu-driven Help facilities.

A new version of the IBM Distributed System Executive (DSX), a network management program, is now available for MVS and MVS/XA systems. This is said to provide, among other things, support for System/360s as a node type. It will enable programmers and network managers to distribute program application changes and maintenance information to remote System/360s from a centralized site, the company reported. The basic initial license charge for DSX is \$2,700, with a monthly

charge of \$900.

Finally, IBM unveiled two new voice and text messaging capabilities. The first is a new version of its Audio Distribution System that triples the number of subscribers who can use the voice store-and-forward system. Now 3,000 people can use the system to send and receive voice messages. Available in December, the new version carries a one-time charge of \$15,200, a process charge of \$1,850 and a recurring monthly charge of \$950.

Secondly, IBM announced the Voice/Text Messaging System for VM systems. This product is said to enable telephone messages to be distributed to users through their terminals, Displaywriters or IBM Personal Computers using the Professional Office System note format. It will be available in October at a one-time charge of \$9,600.

More information is available from IBM Information Systems Group, 900 Kings St., Rye Brook, N.Y. 10573.

Second-class postage paid at Framingham, Mass., and additional mailing offices.

Computerworld (ISSN-0010-4841) is published weekly, except: January (6 issues), February (6 issues), March (5 issues), April (7 issues), May (5 issues), June (7 issues), July (6 issues), August (6 issues), September (7 issues), October (7 issues), November (6 issues), December (5 issues) and a single combined issue for the last week in December and the first week in January by CW Communications/Inc., 375 Cochituate Road, Box 880, Framingham, Mass. 01701.

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Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed: write to Circulation Dept. for subscription information.

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## NEWS

# IBM offerings seen threat to supermini competitors

By John Desmond  
CW Staff

RYE BROOK, N.Y. — IBM's latest hardware announcements (see stories page 4) pose a challenge to superminicomputer vendors that have traditionally had price/performance advantages over Big Blue in the science and engineering markets, industry analysts said.

Frank Gens, an IBM analyst with the Yankee Group in Boston, characterized IBM's announcement of two high-end System/38 models as a "one-two punch" to superminicomputer vendors such as Digital Equipment Corp., Wang Laboratories, Inc. and Data General Corp. But, he said, the announcement of a low-cost model in the 4361 mainframe family may be a "one-two-three-four punch" to those vendors.

"IBM has thrown down the gauntlet to the supermini vendors," Gens said. "IBM has come in with a low-cost product that is very competitive with the DEC VAX-11s, more competitive than the Prime Computer, Inc. 50 series and inches very close to the [DG] Eclipse MV line."

## Kick to supermini vendors

The recently announced 4361 Model 3's floating-point option, which IBM claims doubles performance for science and engineering functions, is a kick to the supermini vendors, Gens said. The autostart feature also makes the Model 3 attractive as an office system because it minimizes the need for DP staff to load programs, he added.

Regarding the announcements of the Models 20 and 40 in the System/38 line, Gens said, "IBM has essentially given the System/38 hardware base a face-lift and shifted the family up." He anticipates still more models in the System/38 line and claimed that IBM eventually will migrate System/38 users to the 370 architecture in the 3080 line. He also expects that higher end System/36 models will soon start "squeezing out the bottom" of the System/38 product line.

In contrast with the 4361 Model 3 announcement, Gens saw "no real price/performance improvement in terms of dollars per [millions of instructions per second]" for the System/38 announcements, although internal performance was improved.

Ken Harvey of CSP by Ken Harvey, Inc. of Toronto, a consulting firm, said the 4361 Model 3 "is clearly aimed at entry-level mainframe requirements and multiple-location data centers such as banks."

Harvey described the 4361 Model 3 as a "souped-up" 4331. With the announcement that the 4321 and 4331 have been discontinued, Harvey said the "clutter and confusion" in the 15-model 4300 family has been partially cleared up.

Harvey said performance improvements in the 4361 Model 3 were achieved from "pipelining," which he said involves concurrently processing different portions of consecutive instructions and was once limited to larger IBM CPUs. The computing engine in the 4361 is the size of a shoe box, like that in the 4321 and 4331, Harvey said, but the 4361 has additional boxes to achieve the added performance.

What impact do the announcements have on 4321 and 4331 users?

"While the 4321s and 4331s out there won't be popular, they do become an attractive box because they can be upgraded to a 4361," Harvey said.

The System/38 announcements, in Harvey's view, "quietly tell people that the 38 is here to stay." Like Smith, Harvey said that IBM will continue to extend the upper end of System/38. "[IBM has] doubled its power every two years," he said.

Jack Hart, IBM analyst with International Data Corp., a Framingham, Mass.-based market research firm, said the 4361 Model 3 announcement and the Model 4 and 5 price cuts offer impressive price/performance. "It means that [supermini vendors] are going to see an awful lot more of IBM

in their traditional customer base than ever before," he said.

Hart found it interesting that IBM is offering adapters that allow OEM subsystems and devices to attach to the 4361s. "IBM is much more friendly today in its willingness to connect foreign equipment to its systems. It once took a dim view of that."

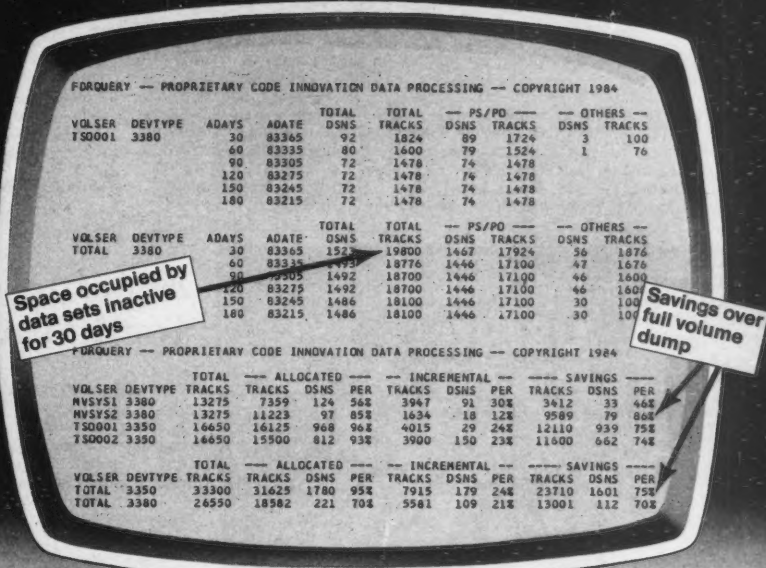
How much of a threat the 4361s pose to the supermini vendors will depend on the software, which Hart characterized as still DP-oriented and not engineering-oriented. "But they're promoting a collection of application software products to try to make inroads in the engineering area," Hart said.

The System/38 announcements af-

firm that system's mainstay role in the commercial marketplace and overlap the line further with the 370 architecture of the 4300 family, Hart said. "For commercial data base operations, the System/38 is looking like a stronger product all the time." Harry Edelson, head of the venture capital firm Edelson Technology Partners, said, "IBM is making changes faster than ever because technology is changing faster than ever."

As for the supermini vendors, Edelson said, "There will be more and more disasters. The ripples from IBM and AT&T announcements will continue to have an impact throughout the industry."

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## NEWS

## DEC unveils high-end Professional

MAYNARD, Mass. — Digital Equipment Corp. last week unveiled the Professional 380, a high-end addition to its Professional series said to offer the equivalent of a DEC PDP-11 minicomputer on a desktop.

Built around the company's J-11 microprocessor chip set operating at 15 MHz, the multitasking, single-user system works two to three times faster than the DEC Professional 350, according to company officials. The 380 also features increased expansion capacity and twice the graphics resolution of the previous top-of-the-line system in the Professional 300 series, DEC said.

The Professional 380, with system unit and 512K bytes of internal memory (expandable to 1M byte), monochrome monitor, keyboard and a 10M-byte hard disk drive, will sell for \$8,995. The system is available immediately, according to the company.

### Other options

Other options include a new \$3,995 Model RD52 33M-byte hard disk drive, a \$950 color monitor, an \$895 Decnet/Ethernet controller and an \$895 telephone management system.

Dick Nixon, Professional 380 product manager, said the 380 is particularly suitable for distributed processing applications, acting as "the low-end workstation for the PDP-11 and VAX computer environment."

The vendor also expects the machine to find a role in computer-intensive engineering and scientific applications, real-time industrial data collection and manufacturing control and office work.

The 380 is said to be upward-compatible with other Professional hardware and software options. The model runs several PDP-11 operating systems, including DEC's P/OS, RT-11 and CTS-300; Venturcom, Inc.'s PRO/Venix; Microsoft

Corp.'s Xenix; Whitesmith Ltd.'s Idris; and Socio-Medics' Mumps.

DEC also launched "the first windowing tool that combines word processing, data base management, a spreadsheet, graphics and a calculator program in one largely integrated system" for the Professional line. Called the Synergy package, it runs on the 380 under P/OS and costs \$695, company officials said.

Among other software programs available, the new \$295 Pro/Sight drawing package, also running under P/OS, reportedly takes advantage of the 380's enhanced graphics capabilities, DEC reported.

### Graphics features

The 380's graphics features include resolution up to 960 by 480 pixels, DEC said. An extended bit-map option board selling for \$1,295 is said to provide displays of up to eight colors simultaneously from a palette of 4,096 colors.

The Professional 380 features four slots available for expansion, as opposed to one slot for the 350, DEC said.

The manufacturer also cut prices on the Professional 325 and 350 models. Cost of the floppy-disk-based 325 with keyboard and monitor has been reduced from \$3,975 to \$3,595.

The price of the Professional 350 with a 10M-byte disk drive has been dropped from \$7,775 to \$6,995, while the 5M-byte version now costs \$5,600, down from \$6,375, according to DEC.

This fall the vendor will offer a kit allowing users to upgrade from the 350 to the 380 configuration, selling for \$4,625.

In addition, DEC cut the price of its RD52 10M-byte hard disk drive by \$400 to \$2,400.

For more information, DEC can be reached in Maynard, Mass. 01754.

## Sperry introduces portable computer

BLUE BELL, Pa. — Sperry Corp.'s Computer Systems operations last week unveiled the Sperry Portable Computer, a 38-lb machine with built-in interfaces and high-resolution graphics.

Like Sperry's Personal Computer introduced last year, the transportable is said to be compatible with the IBM Personal Computer. Microsoft Corp.'s MS-DOS 2.11 operating system and GW Basic are offered as standards.


The system is built around an Intel Corp. 8088 processor (running at 4.77 MHz) and accepts an Intel 8087 mathematical coprocessor, Sperry said. The portable features 256K bytes of internal memory, expandable to 512K bytes on the main board and to 640K bytes via an expansion board.

The Sperry Portable's 9-in. monochrome display offers 640- by 400-pixel resolution, the company said. The system design reportedly incorporates a graphics controller and memory and floppy disk controllers on the main system board, leaving up to four expansion slots open. The Sperry Portable also includes a built-in parallel printer and serial RS-232C communications ports, Sperry said.

The system is said to communicate with desktop MS-DOS personal computers and to integrate into Sperry and IBM processors through standard and optional interfaces.

Three models are offered, with deliveries beginning this month. The Model SP1, with a single 360K-byte floppy disk drive, costs \$2,685. The Model SP2, with dual floppy disk drives, is priced at \$3,110. The Model SPX, with one floppy disk drive and a 10M-byte hard disk drive, sells for \$4,985.

Sperry Computer Systems is located at P.O. Box 500, Blue Bell, Pa. 19424.



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## Senator seeks wiretap law for digital communications

WASHINGTON, D.C. — Sen. Patrick J. Leahy (D-Vt.) said last week he will seek passage this year of legislation to close a loophole in federal law by making unauthorized wiretaps of data communications illegal.

The 1978 federal wiretap law protects voice communications but does not cover the interception of digital transmissions, such as the computer-to-computer transmission of sensitive banking data, legal documents, contract bids and even love letters and other electronic mail, Leahy stated.

The senator said he may add the legislative language to the House-passed computer crime bill (H.R. 5616) now pending in the Senate. Leahy made his remarks as he opened a subcommittee hearing on wiretap issues held by the Senate Judiciary Committee's Subcommittee on Patents, Copyrights and Trademarks.

"This omission is a stunning example of how quickly technology can eat away at rights we all assume are solidly protected by the Constitution," he said. Likewise, Sen. Charles McC. Mathias Jr. (R-Md.), chairman of the subcommittee, issued a statement saying, "If the law lags behind technology, then our task is to revise the law to catch up."

Leahy said he wants to amend Title III of the 1968 omnibus crime control law to cover digital wire transmissions. He also pointed out that there are other gaps in federal wiretap law that need to be addressed

next year. For example, current law may allow transmissions that are partly by wire and partly by radio or microwave to be tapped by government agents without a court order.

The Justice Department said it generally would obtain a court warrant in such cases, if there is a "reasonable expectation" of privacy.

### Partially protected

John C. Keeney, deputy assistant attorney general, said that computer data transmission would be partially protected by the Reagan administration's computer crime bill (S. 2940). It outlaws accessing computers operating in interstate commerce in a scheme to defraud.

An AT&T official endorsed Leahy's effort to give data communications the same legal protection as voice communications. "We would strongly urge that the protection apply to all forms of communications where there is a reasonable expectation of privacy," testified H. W. William Caming, an AT&T attorney.

"The legal protections against unauthorized acquisition of digital communications are left largely to case-by-case determinations by the federal courts of whether there exists a reasonable expectation of privacy," testified Ronald L. Plesser, a Washington, D.C., attorney and privacy advocate. He said that the gaps in federal wiretap statutes pointed out by Leahy, as well as certain court decisions, severely threaten individual privacy.

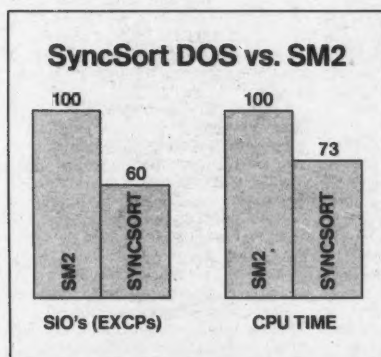


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## NEWS

## Costs barrier to voice/data market

"The potential for this market is huge," is the way Yankee Group senior analyst Amy E. Smith summed up the future of personal computer/telephone combination sets.

This year 10,000 of Cygnat Technologies, Inc.'s Communications Co-systems, 8,000 of Wilcom, Inc.'s Ashers and 7,000 of Natural Microsystems Corp.'s Watsons will be shipped, Smith estimated. She also predicted that total sales of such voice/data add-on products will rise to 150,000 in 1985.

But other researchers suggested that product costs represent a major sales barrier. Prices for the Cosystem with a 300 bit/sec modem begin at \$1,495, while the Asher costs \$795 and the Watson starts at \$849.

The price tags (particularly for the Cosystem) are "simply too high," according to Stephen Caswell of Trigon Systems Group. The market for this type of voice/data equipment will take off only when costs drop to only \$200 or \$300 above prices for standard modems, he forecast.

A standard 300 bit/sec modem,

with software, costs as little as \$130, and many functions offered by the new voice/data systems "are fairly simple things to implement," commented John Cleave, marketing director at U.S. Robotics, Inc. of Chicago, a modem supplier. Some new products sound impressive, "but I'm not going to spend \$1,000 to get them if my old Bell phone and my modem do the job," he added.

However, Wilcom's Steven Fields, vice-president of product development, insisted that the Asher is "very competitively priced" compared with the cost of buying the device's hardware and software components separately. He acknowledged that Asher is "a fairly high-ticket item," but suggested that \$1,000 is the critical limit.

Smith also downplayed price concerns. "The beauty of the personal computer add-on is that you're adding a small bit of equipment to equipment that is already accepted in the corporation — the personal computer," she pointed out. "You don't have to learn how to use a new terminal."

## Demand for micro-based electronic mail seen lagging

Some IBM Personal Computer add-ons offer electronic mail or voice mail, but the demand for these capabilities remains controversial.

On the plus side, electronic mail can save considerable time when you want to send messages that are very short, avoiding such things as telephone tag and time spent talking about other subjects, according to Cygnat Technologies, Inc.'s Federico Faggin.

However, others noted that electronic mail requires similar equipment at the other end — which usually does not exist. "I don't have a great many clients who have electronic mail," said James Matzger of the brokerage firm of Bateman Eichler, Hill Richards, Inc. "We didn't offer electronic mail in our initial version because very few business people use it," said Steven Fields, Wilcom, Inc. vice-president of product development.

Other observers suggested that electronic mail is better handled from a centralized system. "The mi-

cro itself is the worst possible place to put electronic mail," said Stephen Caswell of Trigon Systems Group. He agreed with Faggin that some personal computer programs cannot be sent through a centralized system, but argued that this disadvantage is outweighed by the larger systems' higher reliability and security.

Natural Microsystems Corp.'s Charles Foskett noted research estimating that voice mail saves typical users 20 minutes per day. "Multiply that out and that's a lot of money," he said.

Foskett added that voice mail may enter many large organizations via point-to-point links between personal computers. "In a large organization, there's some predisposition to say that all voice mail needs must be met by attaching a \$400,000 box to the [private branch exchange]," he said. "But these companies will chew on it for a long time before making that capital investment."

### VOICE from page 1

"I don't think it improves your telephone productivity much — maybe 1% to 2%," Caswell said. "I don't look at it as a major productivity improvement, but as a convenience. This isn't like 1-2-3, which allows you to do things you couldn't possibly do on your own."

The Cosystem, Asher and Watson compete with several other add-on voice/data products for the IBM Personal Computer. A different approach comes from Houston-based Zaisan, Inc., which on July 30 introduced the ES.3 workstation. This system combines voice/data and time management features with an IBM-compatible micro in a single

desktop unit.

Other voice/data/personal computer combinations work on a local-area network connecting IBM Personal Computers (such as the Elan from Tecmar, Inc. in Solon, Ohio) or an integrated sitewide communications setup that also provides a host of other services (such as Davoxnet from Davox Communications Corp. in Billerica, Mass.)

Vendors outside the IBM fold, including Texas Instruments, Inc. and Wang Laboratories, Inc., also market voice/data options with their personal computers. Then there are products that are promoted as giving personal computing functions, but which are based on multiuser computers, such as Omni-Action from GTE Communications Systems in Phoenix.

These early entries may be joined in coming months by equipment from telecommunications heavyweights like Rolm Corp. or personal computer manufacturers like Compaq Computer Corp., some industry analysts predicted.

Current products offer varied and bewildering combinations of services, starting with basic data and voice communications and the ability to switch quickly between those two functions. Other menu choices include integrated telephone/data bases; teleconferencing; calendars; time management functions, including time billing; terminal emulation, electronic mail, voice mail and speech synthesis. Going one step further, speech recognition is advertised for Tecmar's Elan, although other manufacturers cast doubt on such claims.

Vendors said that the common thread is the attempt to integrate computer and communications functions for workers who have personal computers on their desks and keep grabbing their phones. Target users are "people who want to roll very quickly in and out of the com-

puter tasks," Faggin commented. Other suppliers pointed to stockbrokers, financial planners, telemarketers and ticket agencies as among the likely first users. All suppliers maintained that Fortune 1000 companies are beginning to buy the devices in quantity.

"The most useful function is the dialing directory," said James Matzger, vice-president at Bateman Eichler, Hill Richards, Inc. in Santa Clara, Calif., who uses a Cosystem at home and at work. "It's almost like a personal [telephone] operator," said Amy Smith, senior analyst with the Yankee Group in Boston.

Other users applauded the calendar and time management functions, often with a special fondness for time billing. Consultants "can sit there and watch the cash register," noted Robert Solomon, vice-president of Intermatrix in North Hollywood, Calif., which makes a phone add-on for the Apple Computer, Inc. Macintosh.

On the minus side, one major limitation for some voice/data add-ons is the lack of multitasking capabilities. "Any system that doesn't allow you to run a program at the same time as you take a call is useless," Caswell insisted. Multitasking noticeably slows down the IBM Personal Computer, however. The Cosystem and the Zaisan ES.3 avoid this by adding separate processors.

Users also noted minor handicaps, including a general lack of polish on the software and the considerable memory requirements (192K bytes for operating system and voice/data software in Watson's case).

Finally, the requirement for users to alter their working habits significantly may be the largest obstacle to widespread introduction, Caswell predicted. "I'm getting very surprised at the resistance of human beings to this kind of change," he stressed.

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## NEWS

# Computers help professors predict Reagan in a walk

By James Connolly  
CW Staff

Their formulas and data may vary from campus to campus, and in some cases the results do not please the prognosticators. But a group of political science professors said their computers predict an easy Ronald Reagan victory in November.

Political scientists have been experimenting with computer-based multiple regression models to predict the winner of the race for the White House. At least a half-dozen researchers draw on different data, and while they vary by a few percentage points in their results, they all agree that Reagan will win, barring a major foul-up on his part.

"What we are trying to do is to better understand why an election is won or lost," said Yale University Associate Professor of Political Science Steven J. Rosenstone.

Rosenstone, who uses an IBM 4341 to maintain his data and run his model, declined to say how wide the Reagan victory margin will be, but said it will be well beyond the 2% margin for error in his popular vote forecast.

Using a different formula and a different IBM 4341, Thomas Rice, a professor of political science at the University of Vermont, predicted that Reagan will collect 54.48% of the popular vote, an easy win, even with Rice's 2.5% error margin.

Rice, Rosenstone and other researchers use various off-the-shelf and in-house statistical packages.

Their formulas use multiple regression — making forecasts by linking previous voting patterns to a series of variables.

The forecasters, working independently but staying in touch through their writings, examined presidential elections starting back with the 1948 "Dewey Wins" race that surprised most experts. For that election and for the contests that followed, the researchers assigned mathematical values to such variables as the annual change in the gross national product (GNP) and the incumbent's popularity six months before the election.

Rice used those two figures in his model, while Rosenstone carried his work several steps further, including variables such as how the voters perceive the economy and the candidates' stands on various issues; voting patterns; whether the nation was at war or at peace; and whether a candidate's party was divided. Rosenstone also predicted votes by states which show Reagan a clear victor in the electoral college.

Rice took Reagan's May popularity figure of 56% and a GNP growth rate of 1.7% and inserted those figures into his model. He multiplied Reagan's popularity by .34 and added 33.03. He then multiplied the economic growth figure by 1.42 and added the subtotals to project Reagan's popular vote at 54.48%.

But applying their models to past elections, Rosenstone, Rice and Princeton University Professor of Politics Stanley Kelley report that the variables would have pointed out the winner in all but two of the nine contests since 1948. Kelley said he had the greatest difficulty with the three-candidate races of 1968 and 1980, while both Rosenstone and Rice said the unusually close election races of 1948, 1960 and 1976 were

the toughest to predict.

Rice said his model, run six months before the election, has a 2.5% margin for error, which he compares favorably to the Gallup Poll's 2% margin conducted only days before the election.

In a scholarly paper published earlier this year, Rice and his coauthor, University of Iowa Political Science Professor Michael Lewis-Beck, noted, "We offer no sophisticated theory of voting, rigorously tested in a statistical model. Instead, we freely explore the performance of numerous simple measures of popular aggregate variables that apparently reflect, in at least a rough way, determinants of individual voting behavior."

Presidential election predictions

Actual Popular Vote Percentage for Incumbent Party		Predicted Vote Percentage	Prediction Error	Predicted Winner	Prediction Success
1948	49.80%	48.40%	- 1.40	Dewey	Wrong
1952	44.60	43.03	- 1.57	Eisenhower	Right
1956	57.80	57.91	.11	Eisenhower	Right
1960	49.90	54.28	4.38	Nixon	Wrong
1964	61.30	59.90	- 1.40	Johnson	Right
1968	42.90	48.14	5.24	Nixon	Right
1972	60.90	56.21	- 4.69	Nixon	Right
1976	48.50	49.91	1.41	Carter	Right
1980	42.40	40.32	- 2.08	Reagan	Right

CHART COURTESY OF THE JOURNAL OF POLITICAL BEHAVIOR

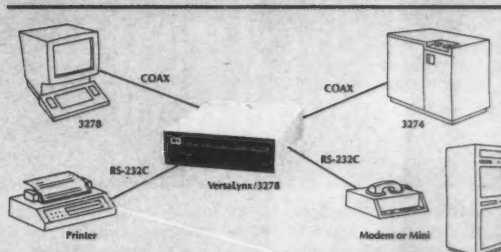
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## NEWS

# Phone company touts savings of residential charge

By Phil Hirsch  
CW Washington Bureau

WASHINGTON, D. C. — Companies leasing multiple dial-up circuits from New York Telephone Co. could save \$3.69/line/mo if the Federal Communications Commission were to impose a \$4.45/line/mo charge on residential and single-line business users. There would be savings for the latter as well.

This is the key conclusion of a study submitted recently to the FCC by the New York and New England Telephone Companies, which make up the regional holding company Nynex. Since then, a number of other divested Bell operating companies have filed similar studies.

Essentially, Nynex contended that by reducing the cost of local switched-access, or dial-up, service from nine cents per minute (the present level) to six cents per minute, New York Telephone would lose much less business to bypassers, and therefore the revenue requirement needed to offset that loss would be reduced.

Meanwhile, lower rates for local switched access would cut costs for long-distance carriers, enabling them to reduce their charges.

The net effect of these two developments — the reduced revenue requirement needed to offset bypass and the lower rates charged by toll carriers — would be the per-line re-

duction of \$3.69/mo.

The company said that if a \$4.45/mo surcharge is imposed on residential and single-line business users, it would be possible to reduce local switched-access charges from nine cents to six cents per minute.

Several months ago, the FCC proposed a \$4/mo surcharge on residential and single-line business users, but deferred final action on it until next year because of vigorous opposition from Congress and a number of consumer groups. The commission is now gathering information on the likely impact of imposing such a fee, and the studies submitted recently are part of that effort.

Nynex, as well as other respondents, stressed that residential and single-line business users also will benefit from the FCC plan. The New York Telephone study found, for example, that these users, even if they paid a \$4.45 monthly surcharge on each line, would save more than that amount in reduced usage charges from toll and local carriers. The former would reduce their rates because of the lower local switched-access charge; the latter would need less revenue to offset bypass.

One of the other studies submitted to the FCC was prepared by Bell Communications Research, Inc., a group formed by the seven regional holding companies. The Bell Communications Research study, which was based on data from divested Bell op-

erating companies serving 39 states and the District of Columbia, predicted the same savings for residential and single-line business users.

The Nynex study, in addition to discussing the impact of bypass on rates, discussed the growth of alternate transmission facilities. The company reported that 23 teleports are now in some stage of development throughout the U.S. This, according to Nynex, is one of many indications that bypass is a rapidly growing threat.

Also, use of CATV for wideband data transmission is increasing. Manhattan Cable Co., Nynex noted,

which recently added three major financial firms to its customer list, will soon be wiring the New York and American Stock Exchanges and plans to interconnect with the New York Teleport. Also, cable operators are building private networks; one recent example, Nynex said, is Wang Laboratories, Inc. of Lowell, Mass., which has contracted with Colony Communications for a 47-mile net.

"A significant factor in the development of . . . bypass is that the cost of [digital termination system] equipment has dropped over the last two years to about one-tenth of its original price," Nynex added.

## DPMA awards \$11,500 in grants

PARK RIDGE, Ill. — The Data Processing Management Association (DPMA) Education Foundation has awarded a total of \$11,500 in grants and awards to three colleges — the University of Evansville (Ind.), California State University at Hayward and the College of St. Joseph in Rutland, Vt.

The funds will go to aid projects that "further education in the areas of information processing, computer science and computer applications in business," the foundation said.

At the University of Evansville,

the grant will reportedly be used to support a fellowship fund for the Fifth Annual Small College Institute in Data Processing. California State University's grant will initiate the development of a model curriculum for graduate computer information systems education.

The College of St. Joseph will reportedly use its grant to develop a model business institute for educational and business problem-solving services.

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## NEWS

# IBM, rivals feel Personal Computer compatibility pains

By Edward Warner  
CW Staff

Hailed as having brought greater speed without sacrificing IBM Personal Computer compatibility, several new Intel Corp. 8086 and 80286-based microcomputers — including the IBM Personal Computer AT — now appear unable to run certain IBM Personal Computer programs.

The IBM Personal Computer AT, based on the 80286 microprocessor, a high-performance cousin of the Intel 8086, cannot run ten IBM-labeled Personal Computer programs: BPI Accounting, Homeward, Insurance Agency System, Typing Tutor, Time Manager, UCSD P-system and four education/game style programs, according to IBM spokesman Mike Reisman. Reisman said, however, that "Most of our software is compatible with the [Personal Computer] AT," but he said that IBM has not tested any third-party software on the AT.

Lotus Development Corp., meanwhile, has claimed that its 1-2-3 and Symphony integrated packages will run on the AT.

Among all of the Microsoft Corp. programs for the Personal Computer, the AT is only able to run one, Multiplan, according to Microsoft spokesman Marty Taucher. Those which will not run include Microsoft Word and, according to an IBM manager, Microsoft Flight Simulator, the often-used benchmark for Personal Computer compatibility.

"IBM is having the same problems as the compatibles," Taucher said. The problem, he explained, arises from the fact that the most sophisticated Personal Computer programs bypass the operating system to address hardware directly. The different architecture of the AT makes it impossible for these programs to run, he said. Microsoft will port all of its programs for the Personal Computer to the AT, he noted.

Another problem for the AT is that it can read

Personal Computer files, but not write to them. The AT has a drive that uses 96 track/in.; the Personal Computer's drives can only read 48 track/in. IBM's Reisman also noted compatibility problems with some IBM memory expansion boards and the IBM Personal Computer's asynchronous communication adapter.

Information on the software compatibility of the relatively new 8086-based micros from AT&T, Compaq Computer Corp. and Eagle Computer, Inc. is harder to come by. The Compaq Deskpro and the AT&T Personal Computer 6300 were introduced in late June, and both reportedly are in short supply with dealers.

The Eagle Computer Turbo XL, meanwhile, does run Lotus Development Corp.'s 1-2-3, according to Eagle Computer's director of product marketing, Dave Clausen. Clausen said that the only Personal Computer software that the Turbo XL does not run is Home Budget, from Howard Soft, Microsoft Word (four out of five type fonts reportedly are operative) and Advanced DB Master, from StoneWare, Inc., the latter because it is based on the P-system operating system from Softech Microsystems, Inc. The Eagle Turbo does not run P-system-based software, Clausen said.

The Boston-based consulting and newsletter firm Seybold Publications, Inc. said it has not yet tested any of the new 8086-based compatibles. Future Computing, Inc., a Richardson, Texas, personal computer consulting firm, has only been asked to test AT&T's Personal Computer 6300 so far, according to John Hemphill, vice-president of its technology group. Future Computing tests microcomputers for their level of IBM Personal Computer compatibility.

Future Computing, Hemphill said, found the Personal Computer 6300 to be operationally compatible, its highest designation. At that level, the

top IBM software, peripheral boards and diskettes must run on the compatible. Future Computing did not test for compatibility using clock-speed dependent software, Hemphill said.

AT&T's Lee Smith, district manager for product planning for office systems products, admitted that the clock-speed dependent programs of the IBM Personal Computer "may be a problem" on the AT&T micro, but said the firm's testing found only two programs, both integrated software packages, that would not run on the Personal Computer 6300. They are Context MBA in its PC-DOS version from Context Management Systems, Inc. and Jack II, from Business Solutions, Inc.

## More reliant on bus-board interface

Smith claimed that communications software is actually more reliant on the bus-board interface hardware than the clock speed and said "as far as we know, all communication boards and option cards, including IBM memory cards, work in our [personal computer]." Smartcom was tested on the Personal Computer 6300, he said, and Hayes Microcomputer Products, Inc. was impressed enough with the performance to ask AT&T to let them use a Personal Computer 6300 in their trade show exhibits. Crosstalk also ran, he said.

Compaq's tests of its Deskpro, meanwhile, found that it cannot run three Personal Computer programs, none of them well known or with applications in business, according to spokesman Ken Price. The programs, such as the game "PC Casino," will not run on any Compaq model, Price explained, because their authors bypassed the computer's Basic I/O System to make calls directly to hardware.

An independent investigation of what will and will not run on the Deskpro, however, has not yet been made.

## Add-on boards posed greatest problem for 8086-based micros

By Edward Warner  
CW Staff

The biggest hurdle to overcome in developing an Intel Corp. 8086-based IBM Personal Computer clone involved getting the add-on boards to run on a true 16-bit system, according to Ron Ward, an executive vice-president with Future Computing, Inc., a personal computer research firm.

The four major manufacturers of 8086-based personal computers — Eagle Computer, Inc., Compaq Computer Corp., AT&T and IBM, — he said, divided themselves between two different routes to that goal:

AT&T Information Systems, maker of the Personal Computer 6300, chose to divide its array of expansion slots into two groups: one that would work with the slower 8086-compatible boards and one for the faster 8086-based units. IBM also followed this path, he noted, in its design of the weeks-old Personal Computer AT, a machine that uses a high-performance cousin of the 8086, the 80286.

### Either board type

Compaq and Eagle Computer, however, choose to incorporate internal switches that would allow either type of board to be used. The switch in Compaq's Deskpro, its relatively new 8086-based model, can be actuated by the user or by the software itself, according to a Compaq spokesman.

Software compatibility also presented a problem, largely one of finding a compatible ROM Bios, according to John Socha, contributing editor of the magazine *Softalk* for the IBM PC. ROM Bios is an operating system embedded in nonvolatile memory which acts as an internal traffic cop to control peripherals and memory management functions.

ROM Bios has become the crux of IBM software compatibility, explained Lance Hansche of Phoenix Software, Inc., because most software writers are writing programs that sidestep the Personal Computer's operating system and interact directly with Bios in order to boost performance and to gain copyright protection.

In May, Phoenix introduced Personal Computer-compatible ROM Bios software for use by the manufacturers of compatibles. Its ROM Bios, developed by a man whom Hansche called "a total Intel [Corp.] virgin," is used by the AT&T Personal Computer, Hansche said.

The developer of Phoenix's work-alike ROM Bios had to know nothing about the Personal Computer's Bios, Hansche said, because IBM guards its proprietary ROM Bios fiercely.

Earlier this year, IBM threatened Eagle and Corona Data Systems, Inc., claiming both had copied parts of its ROM Bios. Rather than fight, the two switched.

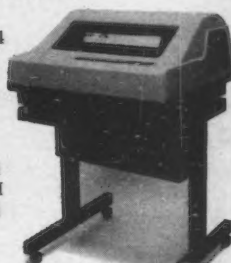
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## NEWS

# Conference attracts cross-section of Unix users

By Kathleen Sullivan  
CW West Coast Bureau

LOS ANGELES — Attendees at last week's Unix Systems Expo/84 conference represented a cross-section of the audience the Unix market is trying to address — from neophytes taking their first look at the Unix market to experienced users trying to stay on top of the burgeoning market.

Robert York, project manager for Jones Brothers Construction Corp., a Beverly Hills, Calif.-based commercial construction firm, said his company plans to install a Unix-based minicomputer system in its offices.

At present, the firm is using a time-sharing service for its basic accounting needs while relying on a

personal computer for its specialized construction management tasks. But the company "would like to integrate its world" by putting its applications on a single system that can be shared by up to 30 users, York said.

Although Jones Brothers has decided to adopt AT&T's Unix as an operating system, it has not yet settled on a hardware vendor, York said. In addition to studying the hardware offerings, York said, he was also looking at applications software, trying to fill the firm's need for word processing, project management and relational data base management packages.

Wayne Kline, an applications consultant with the Automated Data Processing Group of Security Pacific

Bank, based in Glendale, Calif., said he has already had some experience installing a Unix-based system, adding that the bank's first encounter with it was not successful. However, he said he has not given up on the idea of installing a Unix-based system at Security Pacific.

In addition to end users, the Unix Systems Expo/84 also attracted a variety of independent software consultants and developers.

For Kevin Armstrong, president of DBpros, a fledgling software development firm based in Los Angeles, the convention was a chance for him to get more information on Unix-based micro software packages.

Armstrong, whose company has focused on the single-user, PC-DOS-

and CP/M-based market, said some of the firm's customers are beginning to show an interest in moving into multiuser, Unix-based systems. Armstrong said his primary goal was to find out what kinds of software packages, particularly data base management programs, are available under Unix.

The show also brought international visitors to the Los Angeles Convention Center. Masatoshi Hinoshita, a managing engineer for Tokyo-based SRD Corp., an international OEM supplier of credit card readers, said his company has already installed one Unix-based system. But the firm is in the market for another to use in developing software for manufacturing, he said.

## Office users want friendly interface before embracing Unix: speaker

LOS ANGELES — Users are not ready for an "unadorned Unix" and will not welcome the system into their offices with its existing user interface.

That was the message Neil Henderson, chief programmer for Looking Glass Research, a Sacramento, Calif.-based software consulting firm, conveyed to his audience at the Unix Systems Expo/84 conference held here last week.

The task of developing a new user interface for Unix will be a formidable one for software developers, Henderson claimed. To illustrate the magni-

tude of the work ahead, he described some of the lessons Looking Glass learned while helping one office convert to a Unix-based system:

### Conversion lessons

- Most of the business professionals had no typing skills.
- Most of the users refused to read the Unix manual or any of the how-to-use Unix books available.
- Most users were intimidated by the Unix system's terse, "unpronounceable" commands and

were unlikely to learn them.

■ Most users who had learned MS-DOS and CP/M commands by rote revealed a [marked] lack of understanding of some of the key concepts of data processing.

Since none of these factors are expected to change in the near future, all the evidence points to a "critical need" for a user interface that caters to this new Unix audience. The user interfaces that are currently available, menu-driven Unix shells, for instance, are only an "interim solution" to the problem, he said.

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## NEWS

## Harris plans Unix implementation on its superminis

FORT LAUDERDALE, Fla. — Harris Corp. became the latest entrant in the growing large-systems Unix marketplace with the announcement last week of a phased implementation of that multitasking operating system on the company's entire line of virtual memory superminicomputers.

According to a spokesman for Harris' Computer Systems Division, the phased implementation involves the development of an interactive, multi-user environment combining performance features of Harris' VOS and Unix System V. The Unix shell and necessary support software reportedly will be implemented on top of the VOS kernel, resulting in the Harris VOS/Unix Environment (VUE).

The spokesman said the development and availability of Unix System V, with certain University of California at Berkeley enhancements, as a

transparent subsystem running concurrently with Harris VOS will be implemented in three phases. Phase 1 consisted of the development of a production-quality C language compiler, Harris C, which was announced earlier this year (CW, April 4).

Phase 2 reportedly will involve the incorporation of key Unix applications and system calls, including modifications to the VOS kernel to support Unix Fork, Pipe and Exec operating system capabilities. Those Unix features will be available to both VOS and VUE users by the first quarter of 1985, the spokesman said.

Phase 3 will involve the final implementation of commands and system calls not incorporated in Phase 2. When Phase 3 is completed, full Unix System V will be running on Harris superminis as part of the VUE system. Phase 3 development work will

continue through 1985, the spokesman said, and delivery of the fully optimized, fully concurrent VUE is scheduled for the end of that year.

Harris has targeted VUE to the engineering, scientific, aerospace, computer-aided design and manufacturing and office automation environments. It reportedly will also be useful for developing and rehosting Unix-based software.

Asked what advantages VUE will offer over stand-alone Unix System V, the spokesman said that throughput with VUE will be similar to that of VOS on Harris superminis supporting the same number of interactive users. Because VUE utilizes the VOS kernel, including hardware virtual address registers, characteristics of Harris processors will carry over to Unix. VUE will also utilize standard Harris compilers for optimum perfor-

mance in generating reentrant code.

In addition, all VOS applications packages and third-party software will be available with VUE. Files generated with VUE will be compatible with files generated under VOS. VUE files will be accessible from VOS and files generated under VOS will be accessible through VUE. Through VUE's concurrent operation capabilities, the spokesman said users on the same supermini will be able to run either operating system.

The spokesman said Harris plans to make VUE available to existing VOS users and new customers through a number of incremental releases scheduled for 1985. Pricing for VUE is expected to begin at \$2,500.

Harris' Computer Systems Division is located at 2101 W. Cypress Creek Road, Fort Lauderdale, Fla. 33309.

## Usta petitions FCC to reverse AT&T Information Systems decision

WASHINGTON, D. C. — "AT&T Information Systems will be able to offer a Message Toll Service (MTS)/Wats-equivalent service by utilizing AT&T private lines in conjunction with exchange carriers' special access offerings... The lower costs [of such services]... will permit AT&T, for the first time, to provide untariffed... end-to-end prices for large and aggregated smaller end users."

So said the U.S. Telephone Association (Usta) in

a petition to the Federal Communications Commission asking the FCC to reconsider its decision allowing AT&T Information Systems to resell basic services offered by AT&T Communications.

Usta, and others, said that the decision would promote bypass. As Usta put it, "When the ability to attractively price MTS/Wats-like service is added to the present [AT&T Information Systems] offerings, local-exchange carriers will be faced with

a bypass provider of unexpected potency."

Long-distance carriers had similar reservations. GTE Service Corp. said, "By permitting [AT&T Information Systems] to acquire transmission services and facilities from [AT&T Communications]... the [FCC] presents AT&T with an unparalleled opportunity to segment markets, to tailor tariffed offerings [and] to effectively deaverage rates for basic communication services."



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## NEWS

## Sequoia set to unveil Unix-based, multi-CPU system

By John Desmond  
CW Staff

MARLBORO, Mass. — Sequoia Systems, Inc. is slated tomorrow to unveil its entry into the large-scale transaction processing marketplace, a Unix-based multimicro-processor system said to compete with transaction processing systems manufactured by Tandem Computers,

Inc. and Stratus Computer, Inc.

The three-year-old company's first product, the Sequoia system, is said to be capable of accommodating up to 64 CPUs, which can share up to 256M bytes of main memory. In addition, the system can be purchased in varying CPU, memory and I/O configurations to accom-

modate various types of transaction processing applications.

The operating system is compatible with AT&T's Unix System V and University of California at Berkeley Unix 4.2, with a kernel written by Sequoia, the company said. The system runs the Ingres relational data base management system from Re-

lational Technology, Inc., a spokesman said.

Each processing module of the system features one Motorola, Inc. 68010 micro-processor, 128K bytes of 40-nsec cache memory and a memory management unit said to translate 24-bit virtual address space to 32-bit physical addresses.

Each memory module of

Sequoia's system includes 2M bytes of error-correcting memory with a 100-nsec access time and four-way interleaving. Also, 128 hardware-implemented locks on each memory element are said to reduce contention for shared resources by breaking up memory into segments.

Each I/O module includes two Motorola 68000 micro-processors for self-checking, 512K bytes of random-access memory and 16K bytes of read-only memory. Four 4K-byte buffers are used to handle direct memory access transfers to and from main memory. The I/O module supports an Intel Corp. Multibus interface board that resides in a peripheral cabinet.

The bus system is a dual, 40-bit, 10-MHz bus, said to allow the system to connect up to 192 elements.

By adding processor modules, the company claimed the Sequoia system is said to be expandable from 2.5 million to 50 million instructions per second. Currently, Sequoia has installed one system at a user test site. That system uses a minimum configuration of two processor elements, two memory elements and two I/O elements, which the company describes as a two-two-two configuration. A second beta site will be a four-four-three configuration and a third test site an eight-12-four configuration, the company said.

### Not yet tested

The company's high-end system has not yet been tested, primarily for economic reasons, according to Vice-President of Marketing Al Dei Maggi. He added that the largest system the firm has actually tested is a four-four-two, or mid-size, configuration, which he said is roughly as powerful as Tandem's TXP system.

The Sequoia's expandability is made possible by the company's patented, dual, asynchronous "segmented-bus" system, which is a two-level structure. Each bus is 40 bits wide, has 32 data/address bits and eight parity bits, operates at 10 MHz and yields an effective data transfer rate of 80M byte/sec, the company said.

The price for a Sequoia System with a two-two-two configuration, including an operating system, 400M-byte Winchester disk drive, disk controller and C compiler, is \$290,000, the company said. The price for a four-four-three configuration is \$460,000, and the price for a 10-17-six configuration is \$1.5 million, the company said.

More information is available from Sequoia Systems, Boston Park W., Marlboro, Mass. 01752.

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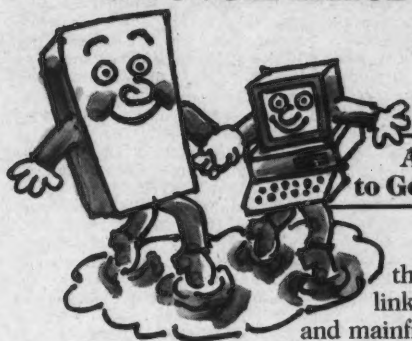
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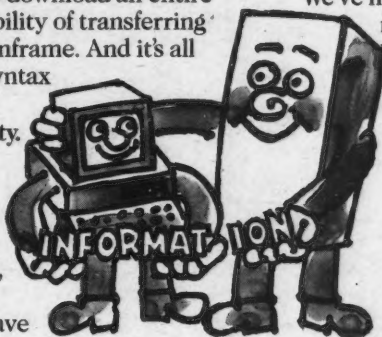
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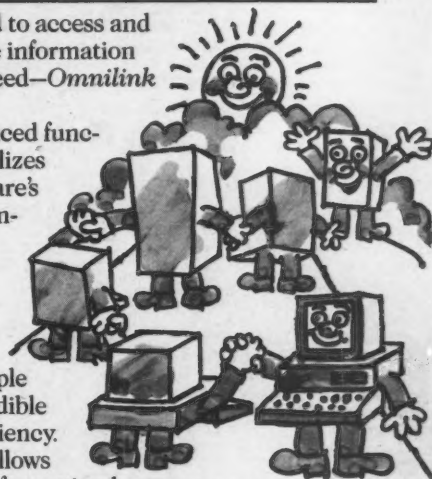


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## NEWS

## U.S. poses high-tech export rule revision

By Mitch Betts  
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Commerce Department last week proposed a new system for licensing exports of sensitive high-technology equipment that drops several of the strict controls proposed in January in favor of more self-regulation by the exporting companies.

The new proposal does not require disclosure of customer lists or certification that customers will not re-sell the goods without U.S. permission, two highly controversial proposals made in January that were strongly opposed by U.S. firms.

In return for less burdensome regulation by the Commerce Department, the proposal requires exporters to establish internal controls against exports to the Soviet bloc nations and increases government audits of company actions. In addition, the government could revoke the license for violations.

The proposed regulation, published in the Sept. 12 Federal Register, will be subject to public hearings and a 60-day comment period ending Nov. 14. Commerce officials said it may be approved as a final rule next January.

Charlotte LeGates, spokeswoman for the Computer and Business Equipment Manufacturers Association (Cbema), said the group's preliminary view is that the Commerce proposal is "a very, very positive step" because it adopts the Cbema view that exporting firms can do their own investigative work to control exports of sensitive equipment.

The proposal is part of the Reagan administration's broad strategy to keep sensitive equipment, such as advanced computer technology, out of the hands of Soviet

bloc countries. For example, the Commerce Department recently fined Digital Equipment Corp. \$1.5 million in a settlement concerning charges that a DEC subsidiary in West Germany sold restricted computers to a Soviet-linked company [CW, Sept. 10].

The proposed regulation would revise the department's program of distribution licensing of U.S. exports, a special license procedure that authorizes shipments of controlled commodities to multiple destinations under a single permit. About \$20 billion in U.S. exports are covered by this program each year.

The new proposal is a major revision of the January version, which contained stricter regulations that prompted furious reactions from 250 U.S. companies, trade associations and several foreign countries. Computer and electronics firms argued that the strict controls, including customer disclosure and certification, would stifle exports, hurt U.S. trade and cost American jobs.

The thrust of the new proposal is for the Commerce Department to establish the reliability of exporters before granting a license and then audit export records to check on compliance. "Some firms have designed good programs, but have become complacent in carrying them out, and some have control programs that simply need to be improved," the department said.

The proposal would require exporters to submit an internal control program for preclearance review and approval by the Commerce Department. It must name people at the exporting and customer firms who are responsible for compliance; describe systems for assuring compliance and internal auditing; and screen out customers listed in the government's table of export denials.

## Survey finds 42% increase in hiring execs

LOS ANGELES — Hiring of senior executives by high-technology companies rose 42% during the second quarter of 1984, compared with a year ago, according to a recent survey of 750 U.S. corporations and non-profit organizations including government agencies, universities and cultural institutions.

The survey, titled the "50th Quarterly National Index of Executive Vacancies," conducted by Korn/Ferry International, is said to record the hiring practices of executives earning base salaries of \$75,000 or more annually.

In other highlights, the survey found:

- Demand for senior managers rose 53% during the second quarter compared with a year ago.

- Recruitment of general managers led all hiring among executive positions, with such hirings rising to 33% of total demand this quarter compared with 28% a year ago.

- Marketing and sales executives accounted for 18% of total demand in the second quarter, unchanged from a year ago.

The report is available free by writing to Corporate Communications, Korn/Ferry International, 237 Park Ave., New York, N.Y. 10017.

## SEC to enhance data base search capability

WASHINGTON, D.C. — The Securities and Exchange Commission (SEC) plans to make it easier for staff members to search through its data bases of people named in SEC regulatory documents and investigations, the commission announced recently.

Effective Oct. 1, the SEC will enhance the search capability of its computerized Name-Relationship Search System, which relates the names of people in the securities industry with the pertinent SEC data base of regulatory filings.

The SEC notice — required by the Privacy Act of 1974 — indicated that the searches are conducted for investigations by the SEC and other agencies and to respond to public or congressional inquiries.

Under the current name-search system, a user can obtain only summary data from other SEC data bases, so obtaining in-depth information on a particular name requires the user to sign off the name-search system and go to the applicable data base. The new system will permit di-

rect computer access without leaving the name-search system.

The modified system increases the number of data bases that can be accessed by the search system and will also permit phonetic searches and online editing during input.

The changes were accomplished by an in-house reprogramming effort, according to Richard Redfearn, chief of disclosure and enforcement systems development, part of the SEC's office of information systems management.

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## NEWS

# Venture gathers Chinese programmers for U.S. firms

By David Olmos  
CW Staff

SAN JOSE, Calif. — A group of top Chinese computer scientists will be working for U.S. computer companies and other corporations in a first-of-its-kind agreement.

The originator of the agreement is Roderick McLeod, founder and president of the Shanghai Software Consortium, a U.S. company with an office here. The consortium has the first U.S. export license granted by the Department of Commerce for software services in China.

The consortium, which will work in Shanghai, now has a staff of 30 leading computer scientists, analysts and programmers from 10 institutes in China.

The participating institutions have agreed to commit as many as 200 senior programmers, technicians and professors if the demand is great enough, explained McLeod, who also heads International Technology Development Corp., a San Jose-based consulting company in computer-related international trade.

McLeod hopes to convince U.S. software developers and publishers, computer manufacturers and large corporations to utilize the services of the Chinese programmers.

## Cost principal enticement

The principal enticement will be cost, since the going rate for the Chinese programmers will be about \$12 to \$15 an hour, considerably less than what their U.S. counterparts would be paid for the same work.

McLeod said he believes the arrangement will be beneficial to both parties. He said the Chinese want to obtain foreign currency in order to purchase computer equipment and added that a large chunk of those sales will likely go to U.S. vendors.

McLeod said he does not view his venture as yet another instance of taking American jobs offshore. He claimed it would be difficult to find an equally qualified American programmer to do the kind of work the Chinese will be performing.

The Chinese programmers are the "cream of the crop" in their country, McLeod said. Most of the staff members have advanced degrees from some of China's leading universities.

## 'One step behind'

"They're not up to the state of the art because they don't have access to all the

development tools and other things we have here. But they're just amazingly good and well-versed, just one step behind the state of the art," he said.

The programmers' services will include software design, programming, testing and original software authoring. The programmers can read and write EDP-En-

glish and will be working mostly on microcomputer systems made by IBM, Apple Computer, Inc., Commodore Business Machines, Inc., Wang Laboratories, Inc. and Tandy Corp.

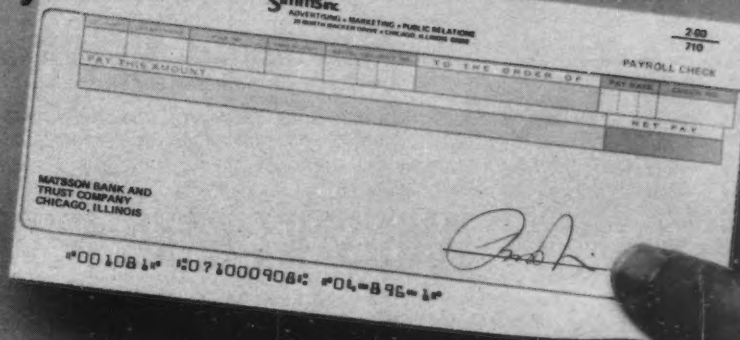
Some work also will be done on the IBM 370, Digital Equipment Corp. VAX-11 and some Honeywell, Inc. and Burroughs Corp. com-

puter systems.

McLeod said the systems the Chinese have available to them are limited by U.S. export restrictions.

An American staff of Chinese-speaking software managers will work in the U.S. and China supervising the work in Shanghai and providing customer support for participating companies.

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## NEWS

# The bell tolls for punch cards at IBM production plants

By Edward Warner  
CW Staff

Punch cards were first used in the 19th century to program a loom — a forerunner of the computer — to weave copy after copy of intricate rugs. Today, the punch card, like the vacuum tube, is fast becoming a symbol of a bygone period in computing.

In what may be the tolling of the card's death knell, IBM, once one of the medium's largest producers, has announced that a lack of demand will cause it to close the last of its punch card manufacturing plants in December.

Two months later, the U.S. Department of the Treasury will begin the switch from punch card to paper payroll checks for government employees, a changeover to be completed by 1986.

IBM's involvement with punch cards was the longest of any; the firm was the offspring of a company founded by the man who developed the punch card coding scheme. During the height of card demand in the 1960s, IBM operated eight punch card manufacturing plants, churning out tons of the cards for use in the batch processing systems that dominated data processing at the time.

During the 1970s came drops in the prices of terminals and the birth of the personal computer. The age of on-line processing was born, and punch card sales plummeted.

One supplier, Premier Data Forms, Ltd. (PDF) of Cincinnati, said its sales of tab cards, from which punch cards originate, has dropped 30% to 40% over the last decade. PDF still makes 220 million cards a year, according to its president, Clement Lodewyck, but a large number of them are for use as the backings of credit card sales forms.

Ten years ago, Lodewyck said, as many as 30 companies made punch cards. Today, only about a dozen do, and, he predicted, in another decade or so only one or two will still be in the business.

## Few mourners

The decline of the punch card is not being mourned in all quarters, though.

"I hate cards. They're slower; they're more cumbersome," complained Harley Koepf, manager of computer operations and data entry in Michigan State University's data processing department.

The university, located in East Lansing, Mich., uses half a million punch cards annually to register its roughly 40,000 students and three-quarters of a million cards annually to process its accounting applications. It simply has not been able to find a more efficient way to register students and still provide a source document for each campus departments as the student housing office, Koepf said.

The university is not alone in its reluctance to abandon the punch card. Michigan Bell Telephone Co. continues to send out punch cards with its bills — about 3.2 million cards per month. According to George Jordan, district manager for out-of-state computer operations, the cards give the firm a cost advantage that it could not get from paper bills read by optical character readers.

Punch cards are also still in use at

the Palm Beach Co. of Cincinnati for inventory control and order allocation. The clothing manufacturer gets no real benefit from using cards, admitted Arti Kidwell, the data processing center's operations supervisor. Palm Beach stays with punch cards not because the firm uses older processing equipment, he said, but because "our methods are older."

The presence of older equipment, though, is a major reason for the survival of the punch card in most firms, according to Steve Baxter, director of computer systems marketing for Burroughs Corp. Punch cards also persist, he explained, because they provide an audit trail and because "having something that is both hu-



Punch cards

CW photo by E. Warner

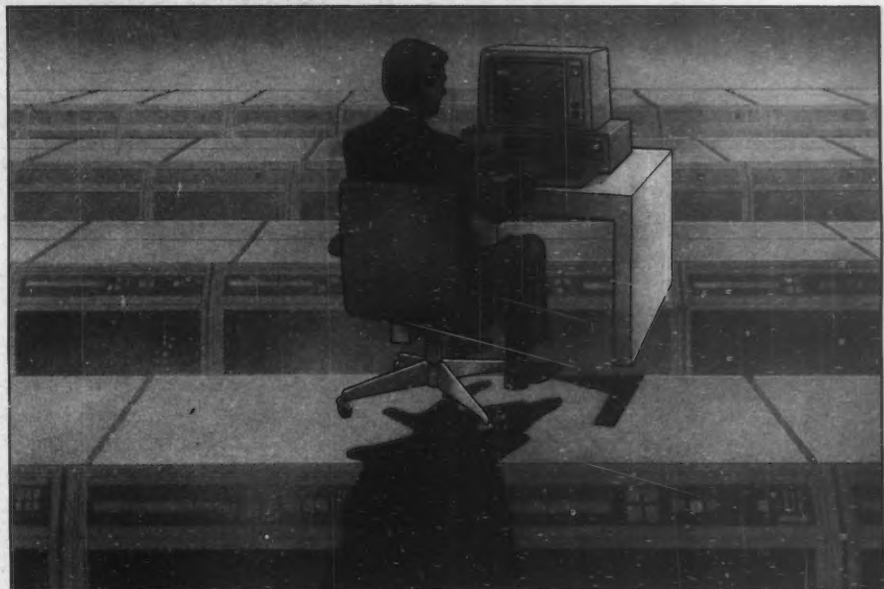
man-readable and computer-readable is a great comfort factor for those awed by computer systems."

One of the great problems with punch cards, according to Michigan State's Koepf, is that they are easily

damaged. Students, he said, often submit sweaty cards, while other workers put opaquing fluid or tape on them, both of which gum up the card reader's sensors. At Michigan Bell, though, the cards come back from customers in pretty good shape, Jordan noted. The cards, in use there for at least 25 years, he said, still admonish customers not to "bend, fold, spindle or mutilate."

Whether for reasons of reliability or speed, the move to on-line processing continues. Palm Beach will eventually convert to a totally on-line system, Kidwell said. At Michigan State, Koepf said the school's accounting system will switch to on-line processing in the next 12 months.

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## NonStop Transaction Processing

## NEWS

## Boston, Montreal exchanges set link

By James Connolly  
CW Staff

BOSTON — The Boston Stock Exchange and the Montreal Exchange plan to establish the first electronic link between a U.S. and a foreign exchange, allowing traders to buy or sell the other exchange's stocks within 30 seconds.

The link, which Boston

Stock Exchange Chairman Charles Mohr said could be in place this month, will run through Automated Data Processing, Inc.'s Data Network Service, which the participating exchanges use to process their transactions.

Mohr said the link will require no additions to the exchanges' computer and communications hardware and

software, although in November the Boston exchange will add two dedicated lines from Montreal and terminals to receive immediate reports on Boston traders' Montreal transactions.

He said traders in Montreal already have access to Quotron, a reporting system operated by the Securities Industry Automation Corp.

The electronic link will give the Montreal traders immediate access to the 300 to 500 most active stocks listed on the U.S. exchange, rather than just the 54 U.S. stocks previously available in Montreal. Boston traders will have access to 40 Canadian stocks.

Intended to increase business at the two exchanges, the link will allow traders to buy or sell up to 1,200 shares of foreign stock at the existing market price.

"A new clearing system and link is what made this possible," Mohr explained, noting that settlement of Boston and Montreal trades will be through the National Stock Linkage Corp. and the Canadian Deposit System.

Mohr said that transactions will be in U.S. dollars, that the trades must be guaranteed by the exchange where the transaction is initiated and that the exchanges agreed to share surveillance data on trading patterns.

### Awaiting commission approval

The link, already approved by the Quebec Securities Commission, is awaiting the approval of the U.S. Securities and Exchange Commission.

Mohr said he expects to explore similar links with European and Asian exchanges, and that nothing in the agreement bars the Boston exchange or the Montreal exchange from making other U.S.-Canadian links.

Another link announced recently will tie the Chicago Mercantile Exchange to the Singapore International Monetary Exchange for trading commodity contracts.

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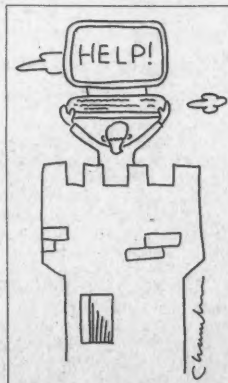
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## NEWS

## Chicago-to-Singapore data line allows 24-hour trading

By James Connolly  
CW Staff

CHICAGO — After two years of preparation, the Chicago Mercantile Exchange recently began doing business around the clock, by routing transactions halfway around the world to Singapore.

The preparations — which included software changes, establishing an undersea dedicated data line, training and diplomacy — let the Chicago Mercantile, a commodities exchange, link up with the Singapore International Monetary Exchange on Sept. 7.

The link lets traders in the U.S. and Singapore execute deals while their local exchanges are closed for the night. It also allows the exchanges' computers to confirm those transactions at the start of the next business day.

The 13-hour time difference between Chicago and Singapore and the telecommunications link allowed 480 off-hour trades the first day, as brokers who normally do business with the Chicago exchange telephoned at 8 p.m. Chicago time to reach Singapore the next day, where it was 9 a.m.

Those transactions were recorded in Singapore on a Wang Laboratories, Inc. VS-45 minicomputer and transmitted at 7:30 a.m. Chicago time over an RCA Global Communications, Inc. 9.6K bit/sec leased undersea line to the Chicago exchange's three IBM 4341 Model 12 mainframes.

In Chicago, the Singapore reports were compared with reports that the 40 participating brokers throughout the U.S. transmitted for confirmation of trades. During the hours the Singapore exchange was closed, the system operated in reverse.

"This came about as part of a mutual agreement between representatives of the Singapore exchange and the board of governors of this exchange. It's a concept that is brand new to our industry — 24-hour trading," said Don Serpico, Chicago Mercantile's vice-president for MIS.

Serpico said a 24-hour commodities market allows a trader to buy a futures contract through his local exchange during regular business hours and to buy more or sell if events indicate a change in the world markets before the local exchange reopens the next day.

At present, the link handles futures contracts on the West German deutsche mark and the Eurodollar (U.S. currency held outside the U.S. and used in European money markets). But Serpico said the exchanges hope to win the Commodities Futures

Trading Commission's approval to add other commodities.

On the Singapore end, the link required purchase of the Wang minicomputer and all related peripherals because the Singapore exchange had not previously been automated. Serpico noted that installing the Wang system and the communications link re-

quired negotiations with the Telecommunications Authority of Singapore. There were also problems maintaining the line during the installation stage.

He said the different screen formats and language presented no difficulty because English is spoken at the Singapore exchange and the transmitted data is com-

paratively simple.

In Chicago, the mercantile exchange's programming staff spent nine months, from definition of needs to final conversion, writing a mutual offset trade program, which transferred the Singapore trade reports to the Culinet Software, Inc.'s IDMS data base system running on the 4341s under IBM's DOS/

VSE, according to Serpico.

Serpico said other software changes were required for the IBM 3705 controllers in Chicago.

He noted that he expects more brokerage houses to participate in the future, although some of the smaller brokers may be reluctant to add the personnel to work nights.

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## NEWS

# Park officials track grizzlies with automated system

By Maura McEnaney  
CW Staff

**MAMMOTH HOT SPRINGS, Wyo.** — In the 2.2 million acres of Yellowstone National Park, park officials are using a computer program to track the movements of some 200 grizzly bears.

The park uses its Data-point Corp. 8630 minicomputer and a software program developed in-house to gather information on the behavior of the park's grizzly bears. Known as the Bear Tracking Program or, more recently, the Wildlife Tracking Program, the system allows park officials to check on bear behavior patterns and provides area rangers with information on bear sightings and related incidents.

This year, an increase in the number of bear attacks on humans has kept park officials busy checking information through the management system, noted Sandy Fowler, park technician. There have been at least four bear-related injuries this year. In July, a bear attacked and killed a 25-year-old Swedish woman backpacking in the wilderness. A few

weeks later, a 12-year-old boy was attacked while sleeping in a densely populated park campground.

Using computers to provide better bear management is not a new concept. A system similar to the one used at Yellowstone was first used at Glacier National Park in Helena, Mont., and was later made available to all national parks in 1978, according to John Dennis, supervisory biologist at the National Park Service in Washington, D.C.

That system, known as the Bear Information Management System (Bims), was serviced by Boeing Computer Services Co. and allowed six national parks to develop a data base on the bears in their parks. Like the Yellowstone system, Bims let parks build files on particular bears or areas of their parks by reading information about a particular incident or sighting into the computer.

But a number of problems with the Bims system and the increased efficiency of letting individual parks access data off their own computer systems last year caused the government to take Bims offline.

Richard Riegelhuth, chief of the division of natural resources at Yosemite National Park in California, said that with Bims, it often took too



long to retrieve information. The system was also down frequently, he said.

At Yosemite, Riegelhuth said, "We had planned to have our own program before Bims came on-line." Unlike Yellowstone, which needed a system to protect visitors from grizzly bears, Yosemite keeps track of the less dangerous black bear, known to pester park tourists for food handouts. In its data base, Riegelhuth said, were notations of bear incidents — data on specific instances ranging from a bear stealing a camper's food to reports of bears knocking down campers to get food. The total number of incidents at Yosemite can range anywhere from 300 to 400 each year, he said.

Using Bims to retrieve information on those incidents was not always easy. "When we used to have our data in

two black binders, we could get our answers faster than if we used the Bims system," Riegelhuth said. "I could walk over to the notebooks and get an answer in 10 minutes; with Bims, it would sometimes take two days."

"Every park had different needs," he added. "Bims was designed to help everybody, and helping everybody was asking too much of a computer program."

For Yellowstone, having its own bear tracking program meant more specific information about bear sightings and the ability to make fast decisions on whether to close a particular area because of potential danger.

"It's a way of exchanging information," Fowler said.

The program, written in Basic and Databas, a Data-point programming language, provides park officials with more than 42 fields in which information can be listed and sorted.

"You can feed in the specifics that you want, for instance, how many male grizzly bears have been seen in the Old Faithful area of the park in 1982, 1983 and 1984," said Elfreda Kaminski, Yellowstone's data processing manager.

According to Kaminski, Yellowstone is considering using the program to track other species of wildlife.

## IRM Executive Briefing

October 18, 1984 The Park Lane Hotel New York City

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## Oct. 1 meet targets IBM

CHICAGO — The fourth annual Conference on Control, Audit and Security of IBM Systems, sponsored by MIS Training Institute, Inc., is scheduled for Oct. 1-4 at the Drake Hotel here.

Seminar sessions topics reportedly will include recovery management for IBM Personal Computers, security of data in an information center environment, capacity planning in large IBM data centers and end-user computing.

Keynote speakers will be Frank H. Dodge of McCormack & Dodge Corp., who is expected to speak on the impact of microcomputer-mainframe link technology, and William H. Murray, program manager for data security at IBM's Information System & Communication Group.

The seminar registration fee is \$695. More information is available from MIS Training Institute, 4 Brewster Road, Framingham, Mass. 01701.

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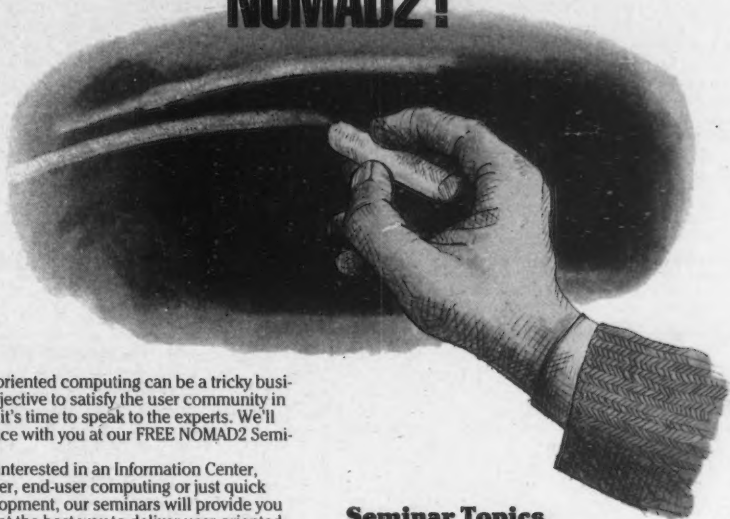
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Cleveland, OH	Oct. 4	Los Angeles, CA	Nov. 6	San Mateo, CA	Aug. 30
Dallas, TX	Nov. 8	Madison, WI	Oct. 10	San Mateo, CA	Oct. 3
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Denver, CO	Oct. 16	Montreal, Canada	Nov. 2	South Bend, IN	Oct. 16
Elizabeth, NJ	Oct. 30	Newton, MA	Nov. 16	Toronto, Canada	Oct. 16
Grand Rapids, MI	Oct. 24	New York, NY	Oct. 25	Vancouver, Canada	Oct. 24
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## NEWS

## U.S Air Force updates Distant Early Warning System

CONCORD, Mass. — After more than 25 years of military use, vacuum-tube radar sets are being replaced. The U.S. Air Force has announced that the radar sets now used in its Distant Early Warning System to detect high flying aircraft will be replaced with newly designed, short-range unattended and long-range minimally attended systems placed throughout Alaska and northern Canada.

The new North Warning System, which is expected to be fully operative in 1992, is the first major update of this country's Distant Early Warning System, according to Lt. Col. Bruce Abbott of Hanscom Air Force Base here. The new system adds the ability to detect low flying aircraft, including cruise missiles. It is expected to cut current operat-

ing costs by about \$40 million a year.

The U.S. Department of Defense recently awarded Sperry Corp. a \$79.7 million, 42-month contract to develop prototypes for two short-range unattended radar units. If approved, the Air Force will give Sperry a second contract to produce 39 of these short-range unattended systems for the North Warning System.

### Total of 52 radar sites

The system will also incorporate some 13 long-range, minimally attended radar units produced by General Electric Co. With the new system, a total of 52 radar sites will be deployed, beginning in 1986. The cost of the project is said to be about

\$700 million.

According to Sperry spokesman Steve Letzler, the short-range radar units will consist of a reconfigurable cylindrical array of antennae with electronic scanning capabilities.

Although the old radar sets were difficult and expensive to maintain, complete modernization of the equipment was not necessary until now, Abbott explained. "The [security] threat declined in the '60s and '70s," he said. But, "that threat has really started to increase again." Over the years, the system did not become totally ineffective, he said. "Some of the radar units were on hills, and they could be adjusted to detect lower flying objects."

## Symphony training seminars set

LOUISVILLE, Ky. — The Cobb Group, Inc. has announced it will conduct two-day training seminars on Lotus Development Corp.'s Symphony spreadsheet software program in 12 U.S. cities in October and November.

The "Using Symphony Seminars" will introduce all of Symphony's capabilities and were designed to help users overcome the difficulties of mastering the program, according to the Cobb Group. The seminar will be taught by Douglas Cobb, author of a

forthcoming book on Symphony.

The dates for the seminars are: New York, Oct. 1-2; Chicago, Oct. 4-5; Los Angeles, Oct. 8-9; Houston, Oct. 11-12; Washington, D.C., Oct. 15-16; Boston, Oct. 18-19; Dallas, Oct. 29-30; Atlanta, Nov. 1-2; Philadelphia, Nov. 8-9; Detroit, Nov. 12-13; Miami, Nov. 15-16; and Denver, Nov. 19-20.

The seminar costs \$500 per person. More information is available from The Cobb Group, Suite 426, 10101 Linn Station Road, Louisville, Ky. 40223.

## SIM meet slated for Oct. 7-11

CHICAGO — "Charting the Course: Mastering the Islands of Information Technology" is the announced theme of the Society for Information Management's (SIM) 16th Annual Conference and Workshop to be held at the Hyatt Regency O'Hare hotel here Oct. 7-11.

According to the sponsor, the conference is aimed at helping attendees meet the challenge of successfully integrating new technologies. The opening address of the conference will be presented by Warren McFar-

lan, author of the *Harvard Business Review's* "Information Archipelago" series.

In addition, Dr. Richard Beal, a member of the White House staff, will speak on "Information Support for the Chief Decision Maker."

The cost to attend the SIM 16th Annual Conference and Workshop is \$950 for SIM members and \$1,060 for nonmembers.

More information is available from SIM at Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

## ADR user forum set for Sept. 19

TORONTO — The annual meeting of Applied Data Research, Inc.'s Cadre User Group will be held Sept. 19-23 at the Sheraton Centre here.

Dr. E. F. Codd, the originator of the relational model for data base management systems, will be the keynote speaker at the meeting. He will discuss "Future Directions in Data Base Management Systems."

More than 160 sessions on ADR software will be held for both DP users and end users.

Cost of the program for attendees from companies licensed to use ADR products is \$365; for nonusers, the cost is \$465. More information is available from Applied Data Research, Rt. 206 and Orchard Road, Princeton, N.J. 08540.

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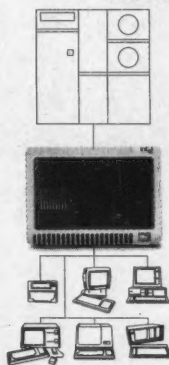
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## NEWS

## Official blames Brazilian government for firm's crisis

### Informatics exec says 'bureaucratic controls' strangled state's 'Cobra' computer firm

BRASILIA, Brazil — During a recent interview here, Col. Edison Dytz, Brazil's Secretary of the Special Department of Informatics, candidly blamed the Brazilian government for the current financial crisis of Cobra, a state-run computer maker on the brink of fiscal disaster. Cobra is presently redefining its business practices with the help of Brazil's National Bank and the country's Special Department of Informatics.

Dytz maintained that Cobra has played a pio-

neering role in Brazil's indigenous computer industry, yet instead of being rewarded for its efforts, Cobra has been plagued by government interference. Because Cobra is a government-owned concern, it is subject to tight bureaucratic controls that inhibit its ability to invest and expand, as well as inhibit its ability to offer competitive salaries. According to Dytz, questions that must be answered before the government intervenes in the company's operations include:

■ What is the strategic role the government will play in the computer industry?

■ What are the limits to the technology that may or may not be developed by that company?

■ In which direction should the company move to accomplish its business plan (vertical or horizontal)?

■ What role should the board of directors and stockholders play in the management of state-run companies?

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CW 9/17

## AFSM meet to cover excellence

ATLANTA — "Changing Priorities — Making People, Technology and Systems Productive and Excellent" will be the theme of the Ninth World Conference and Exhibition of the Association of Field Service Managers (AFSM) to be held at the Hyatt Regency hotel here Sept. 26-28.

According to the sponsor, the purpose of the AFSM conference will be to help product support specialists cope with the rapidly changing field service environment. The conference will feature six seminars — two one-day workshops and four executive symposiums. The results of a recent Arthur Anderson & Co. study on the future of field service will also be reviewed at the conference.

Among the scheduled speakers for the Ninth World Conference are author George Plimpton; *Time* magazine columnist Hugh Sidney; futurist Dr. Marvin Cetron; George Harmon, senior partner with Harmon Anderson International; and Archie McGill, president of Rothschild, Inc.

Representatives from Digital Equipment Corp., Honeywell, Inc., Dialogic Systems Corp. and NBI, Inc. are also scheduled to address the conference.

AFSM member registration for the Ninth World Conference and Exhibition is priced at \$340. Nonmember registration is priced at \$425. More information is available from the AFSM, Suite B, 6237 Presidential Court, Fort Myers, Fla. 33907.



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## NEWS



**INTERNATIONAL  
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**AUSTRALIA**

**WOLLONGONG** — Australia's future is being handed over to multinational corporations, thanks to the "ludicrous" buying practices of Telecom Australia and the U.S. Department of Defense — the two entities that have become totally dependent on these multinationals, according to Dr. Graham Hellestrand, senior lecturer in computer science at the University of New South Wales here. Hellestrand, during a recent address to the Australian Computer Society, said Australia can lay the blame for this state of affairs at the feet of "purchasing bureaucrats whose positions have been secured by promoting this very strategy."

**DENMARK**

**COPENHAGEN** — After a long period of financial wranglings, Christian Rovsing, Denmark's largest computer maker, has declared bankruptcy, and the entire staff of 1,200 was told there would be no paychecks for August. Denmark's Minister of Finance, Ib Stetter, promised government financial aid. Christian Rovsing needs approximately \$15 million, but all attempts to sell the company have failed.

In the past, Christian Rovsing enjoyed lucrative contracts for its computer and communications products from American Airlines, the National Aeronautics and Space Administration and the North Atlantic Treaty Organization, but inadequate financial management during a period of rapid growth caused the company to fall on hard times. Purchase by a foreign company is thought to be imminent.

**JAPAN**

**TOKYO** — NEC Corp. and NEC-Toshiba Information Systems, Inc. jointly unveiled a high-end mainframe system, called Acos System 410 Model 40, to top off their Acos 410 line of machines.

The system can reportedly perform 1.6 times faster than the previous top-of-the-line machine and features an expanded main memory of up to 12M bytes by using 256K bytes of dynamic random-access memory, the vendor explained.

It also comes with multifunction capabilities such as relational data base software and software development support libraries, according to a spokesman.

Acos System 410 Model 40 will lease for \$6,721/mo. Purchase prices were not available at press time. The machine will be available in February.

**TOKYO** — Toshiba Corp. introduced a distributed data processing system called DP/9080 that reportedly features enhanced image processing and communications capabilities. The system features a 32-bit architecture that is said to more than double the performance level of existing Toshiba machines. Its maximum

main memory of 2M bytes is also double that of its predecessor, the vendor said. The system also features 60 circuit lines, enabling configurations of up to 192 units. Pricing on the DP/9080 starts at \$291,666, and it is slated for release in April.

**TOKYO** — Hitachi Ltd. announced that it has developed an artificial intelligence language called Logic-Oriented Language Inferencer (Lonli). Lonli is said to be a version of Prolog, but features an interface that allows it to translate other programming languages, including Fortran and PL/I, the vendor said.

The language is able to run on the company's Hitac M series of computers and can reportedly communicate with software libraries and data bases. It also features Kanji character processing and image processing,

according to a spokesman.

**CHINA**

**HONG KONG** — In the territory's first hacker case here, a 29-year-old man was charged with "abstracting electricity" that belonged to Cable and Wireless Co. (C&W). The unidentified man pleaded not guilty to charges that he gained unauthorized access to C&W's Dialcom computer system and obtained restricted information. He was convicted in court, but given an absolute discharge and no conviction record, sources reported, in the absence of legislation covering computer crime.

**HONG KONG** — The only non-U.S. bank to offer computerized international cash management services to

corporate clients has recently gone on-line here. With terminals in their offices, customers of Chartered Bank in Hong Kong, London, New York, Los Angeles and Johannesburg, South Africa, can check the status of their company's accounts. Support for the bank's international cash management services is provided by General Electric Information Services Co.'s Mark III telecommunication network service.

**SINGAPORE**

**SINGAPORE** — Deltak, Inc. of the U.S. has announced plans to establish Singapore's first computer training center. The center is due to open on Oct. 1 and will offer courses via media including audio-, video- and text-based instruction.

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## NEWS

# System delivers speed to courier's dispatch process



Purolator district office.

BASKING RIDGE, N.J. — Eliminating most of the full hour that telephone orders previously took to reach a dispatcher was only one of the benefits that a courier service gained when it installed minicomputers to assist dispatching, package tracking, marketing and planning.

Purolator Courier Corp. found that its system cut to two minutes the time needed to process a pickup order and let dispatchers use an on-screen grid system to know immediately which of more than 100 trucks in a district can best handle a call.

Computerization also helps the company, which runs an international fleet of 108 aircraft and 4,000 vehicles, trace packages to tell a customer when to expect delivery, maintain contact with past customers, handle word processing and budgeting.

## Surprise benefit

But according to Purolator Director of Transportation Dick Murphy, who supervised use of the first test system at a district office here, a surprise benefit was the impact on employees.

"We found that, besides being more efficient and allowing us to handle more calls, the system improved our working environment and our employees' attitudes. It created a more relaxed atmosphere, a message that was quickly conveyed to our customers," Murphy said.

Beginning with the test site in April 1983, Purolator Courier has been installing Datapoint Corp. 8600 minicomputers as file processors, Datapoint 8605 applications processors and up to 15 Datapoint 8220 conversational terminals in its district offices. That equipment is linked by Datapoint's Attached Resource Computer (ARC) local-area network under Datapoint's RMS operating system.

Software includes Routronic 2000, a truck-routing and freight-handling system developed by Carrier Logistics, Inc., a Rye Town, N.Y., engineering and consulting firm.

## Replaced paper system

The Datapoint system was designed to replace a hand-delivered paper system, which, in the case of the office here, had nine telephone operators taking calls that averaged two minutes and then writing pertinent information on printed forms. Those forms were carried to a dispatcher, who would review truck routes and often reschedule routes for the more than 100 trucks in the New Jersey area. The office handled an average of 600 orders per day.

Murphy said of the Datapoint system, "It tested out very well. We were into a strictly manual system in New Jersey, and we were handling the largest number of calls in the country."

He stressed that only a third of the calls that the operators handled were for orders, with the rest being inquiries about price, about the service itself and about previous orders. He said the office now handles 850 orders per day.

With the computerized dispatch system, operators type information into an 8220 terminal as they receive it over the telephone. If the customer has done business with Purolator

Courier before, the system draws information such as address, normal business hours and billing data from a data base maintained by the Routronic 2000 software, which is written in Datapoint's Databus business-oriented language. Murphy said order-taking now averages 25 seconds, with the order showing on the dispatcher's screen within two minutes.

He added that the software di-



Purolator's dispatching terminal.

vides the dispatcher's screen into grids, listing customer locations within each grid, and suggests which route can best handle each incoming order based upon the routes' capacities.

The system includes a local tracing feature, which lets an operator know where a package is at a given time by keying in a bill-of-lading number.

Murphy said the Routronic 2000 provides Purolator Courier with bal-

anced routes, coded delivery receipts and management information and operating reports.

In addition to the dispatching system, Purolator Courier offices are using Microsoft Corp.'s Multiplan and Datapoint's word processing software in Datapoint's Datashare time-sharing system.

## Word processing useful

"Practically all of our paperwork is handled through word processing. For instance, the computer keeps a list of all new clients. Through word processing, we can automatically send each of these customers a sales letter, along with a bill of lading. We also keep track of customers who haven't used our services for a period of 30 days or more. We send them a letter to see if there is any problem that has caused them to discontinue using our services. It's a very effective way of making contact, as well as ensuring that our service remains at a quality level," Murphy explained.

He reported that the Multiplan spreadsheet is used in budgeting, including revenue projections, and that the ARC network allows users to share access to common worksheets.

The system is now operating here and in Chicago and Washington, D.C., and is scheduled to be installed at most Purolator Courier locations, according to Murphy.



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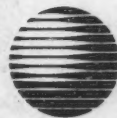
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## NEWS

## On-line tools brighten firm's productivity

LITTLE NECK, N.Y. — At a manufacturer of switches, extension cords and related electrical wiring devices, DP tools are having a direct impact on productivity and cost-effectiveness throughout the manufacturing cycle here.

"It's a lot easier to make better use of existing capacities and facilities than it is to buy a new plant — or to retool an existing one," said Mike Friedlander, manager of data services for Leviton Manufacturing Co. "One way to create those improvements is through the use of better programming tools."

Most of Leviton's corporate information services are provided by a staff of about 40 at company headquarters here. Four years ago, a study of DP operations resulted in recommendations for more on-line systems to handle scheduling, order processing and other manufacturing resource planning functions that were being inadequately served by Leviton's existing manufacturing resource planning system.

### Old system

The old system was generating reports, but there was no direct feedback into the production process, and the existing DP tools simply were not up to the job. Leviton management concluded that trying to write on-line applications in Cobol under IBM's CICS was taking too much time.

Leviton needed several things: a data base management system where the data base structure was easy to change; application programs where new requirements could be added quickly and easily; and an on-line transaction environment.

"After looking around, we ended up selecting Software AG of North America, Inc.'s Adabas for our DBMS and Natural for our new programming language. We also bought Adabas/VM, which allows us to access data in both MVS and DOS environments, and Adabomp, Software AG's Adabas-driven bill-of-materials processor."

After one year of evaluation and two years of production, Leviton has implemented several major systems, including a purchasing system, a traffic system to capture and rate bills of lading to generate payments to freight vendors, a pension accounting system and an on-line order entry system. In addition, a number of existing batch applications have been converted to accept on-line updates.

Friedlander offered two examples of what he called the data processing department's improved response:

"In the first case, a change in pension withholding requirements resulted in a request to automate the related bookkeeping. Using Natural and Adabas, the financial systems group was able to bring up an on-line accounting system in under two months."

The group that did this had no experience with CICS and would not have been able to do this on the old system, Friedlander said, adding that with that system, even with experienced staff, it would have taken three to six months.

"In the second case, we had a need for an on-line order entry system for short orders that have to be turned around quickly. A member of the dis-

tribution systems group, who was fairly new to DP, wrote this system within his first few months of learning Natural. He not only put together the order entry functions, but he also included credit checking, plus passing the data back to the batch systems — a job that, under CICS, would have required an experienced programmer and that would still have taken a lot longer."

Quantifying the improved response intrigued Friedlander, he said. "You hear about 10:1 improvements in programming productivity when you bring in tools like Natural and Adabas. I think that number is really conservative. In three weeks, one programmer did an order inquiry

system comparable to one that I've seen two to three CICS programmers spend two to three months putting up."

With Adabomp, Leviton's manufacturing systems group provided multilevel bill-of-materials reports, product costing and continuity checking.

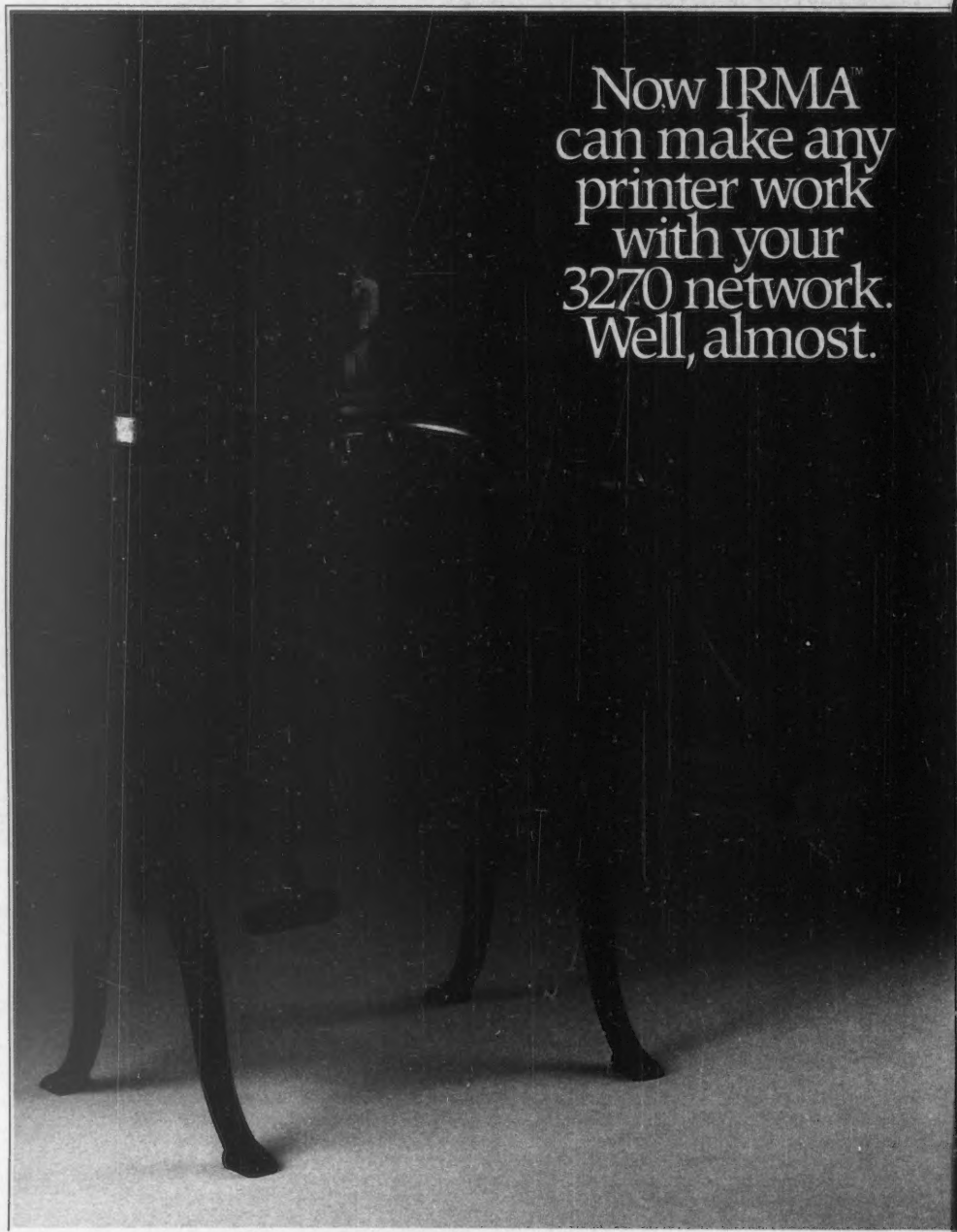
"A few years ago, we were a 100% Cobol shop. By this past year, we were using Natural for 100% of our new on-line programs and for 50% of our batch programs as well," Friedlander said.

"The more of this caliber of service we provide, the more effectively the rest of the company can work," he added.



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## NEWS

## Local networks boost Nasa's space shuttle effort

HOUSTON — At the Johnson Space Center here, local-area networking office technology has given an extra boost to the space shuttle effort.

Supporting the space shuttle — Nasa's space transportation system — is an array of office automation (OA) and communications equipment that includes 80 Xerox Corp. 8010 Star information processing systems and 20 Xerox 820 personal computers linked by 12 Ethernet local communications networks.

Three Nasa directorates — Mission Operations, Flight Crew Operations and Mission Planning and Analysis — have intercommunicating networks and are tied directly to the

office of Director of Space Operations C.E. Charlesworth.

For each launch, Mission Operations is responsible for a complex set of plans and procedures that integrate factors such as payload objectives and requirements, vehicle capabilities and availabilities, crew data, training schedules and launch times, in addition to specifications of orbit, ascent, descent and thousands of other flight details.

According to Eugene Kranz, director of Mission Operations, "When you get down to seven days before a launch, you can't afford to have delays in obtaining critical information."

"Eventually, the discrepancy between the demands of the job at hand

and our administrative support resources produced a series of bottlenecks," Kranz said. Documents that had to be generated, changed right up to flight time and distributed to all of the major people working on a launch would need to be produced for an increasing number of flights by a fixed number of people.

Mission Operations looked at seven OA systems in 1982. An OA system was needed to improve productivity in the document preparation area, with a strong need for enhanced graphics capabilities, and to interface with existing information processing systems without reducing their effectiveness.

The hardware and software select-

ed by Mission Operations had to be able to operate within a classified environment, which was one of the deciding factors in choosing Xerox systems, Kranz said. The final decision was made after Mission Operations evaluated terminal-to-terminal communications capabilities. The networking capability of the Xerox system was another factor that tipped the scales, he added.

The first of 12 Ethernet networks was delivered to the Johnson Space Center in July 1982. According to Kranz, the network markedly improved productivity in the development of technical publications. It produces and updates the flight data file, a multivolume document that the crew uses on-board the vehicle during a shuttle mission.



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*'You can't afford to have delays in obtaining critical information.'*

— Eugene Kranz, Mission Operations

At any one time, over 100 schedules are electronically created on the network. These are updated, distributed and stored on the system through the completion of each mission.

According to Donald Bray, manager of the space center's Action Center, documents similar to those now created on the system would previously have required typing, hand-drawn graphics and cut-and-paste preparation before being sent to the print shop — a cycle that could take up to a month. Major modifications to a schedule would have started the cycle all over again. Now, shuttle schedules, including graphics, are produced in less than two hours and updated as needed in as little as 10 minutes.

Perhaps the most dramatic application of the Xerox 8000 network system at the space center occurs during the course of a mission. From the instant the booster rockets ignite, Mission Operations enters a real-time mode in which decisions must frequently be made in a matter of minutes. During the mission, an anomaly log is maintained on an 8010 Star workstation, tracking every problem that occurs and showing who is working on it, providing an up-to-the-minute problem status.

Data in the log can be sorted and compared with anomaly information from past missions stored in the system. During the mission, the anomaly log is accessed directly as needed and is also printed out on a laser printer for mission status meetings each morning.

With new applications for the system continually developing, John O'Neill, chief of the operations division of Mission Operations, predicted the expansion of the network into new management areas. Personnel at the space center are now aware of the ways in which they can manage information on the Ethernet system. O'Neill said there will be increasing reliance on local networking to keep management apprised of hot spots, trends and potential pressure points.

## NEWS

## Firm ties remote users into CPU with PABX-based net

OAK BROOK, Ill. — A large real estate management company here has tied its remote users into a central computer by using a data communications network built around a data private automatic branch exchange (PABX).

Inland Real Estate Corp., which manages nearly 30,000 apartment units in more than 250 locations in the U.S., purchased its first in-house computer eight years ago. At that time, the company was headquartered in a single building on Chicago's North Side.

Today, however, Inland's corporate offices are scattered in four buildings in three suburbs west of Chicago. In addition, the company operates its residential and commercial sales office from a building in a suburb 20 miles north of the Windy City.

Employees at all five buildings require access to the company's central computers for various data and word processing functions. A data communications network was necessary to provide on-line access to the computer for the various offices, according to Ronald C. Balcer, Inland's vice-president.

Inland's computer system is built around two Digital Equipment Corp. VAX-11/780s with a total of 80 ports. Sixty DEC VT100 and VT102 terminals interface with the computers, as well as eight LA120 DEC Writer III printers.

Other equipment includes five Diablo Systems, Inc. 630 word processors and five Dataproducts Corp. DD550 word processors and Dataproducts B600 and B1000 printers.

The two VAX CPUs are located in a computer center in one of Inland's buildings. Several terminals and printers are in the same building. Most of the terminals and printers, however, are spread among the other three buildings, which are separated from the computer center by up to five miles. In addition, one VT100 CRT and one LA120 printer are in the sales headquarters, Balcer said.

After investigating several options for its data communications network, Inland decided on products from Gandalf Technologies, Inc. The Gandalf equipment includes 10 PIN 9103 statistical multiplexers and 10 9600SM Supermodems. The data PABX, with which most of the other equipment is interfaced, is a Gandalf Private Automatic Computer Exchange IV (Compacx IV). Other equipment includes four Micom Systems, Inc. 8818 multiplexer/modems and two leased dial-up modems.

The Compacx IV, located in Inland's computer center, allows users to access either VAX. Two multiplexer/modems, a dial-up modem and five sets of Supermodems/PIN 9103s are also in the computer center.

The implementation of Inland's current data communications network was actually a two-phase process, according to Balcer. Initially, when the company had a single computer, its concern was only to provide widely dispersed users with computer access for data and word processing functions. The first phase, therefore, involved finding a way to link these users to the centralized computer resource, Balcer said.

Later, when a second VAX was added, the company wanted users to

be able to switch between the computers.

In the first phase, the company decided that the most cost-effective way to link users to the computer was with high-speed modems used on dedicated leased lines.

The modems alone, however, were not cost-effective enough for Inland, Balcer said. The company also wanted to make more efficient use of the lines it was leasing and to cut costs in other ways. The PIN 9103 multiplexers accomplished these goals. The multiplexers are equipped to allow 16 terminals to share a single leased line, and they eliminate the need for a separate modem at every remote terminal location.

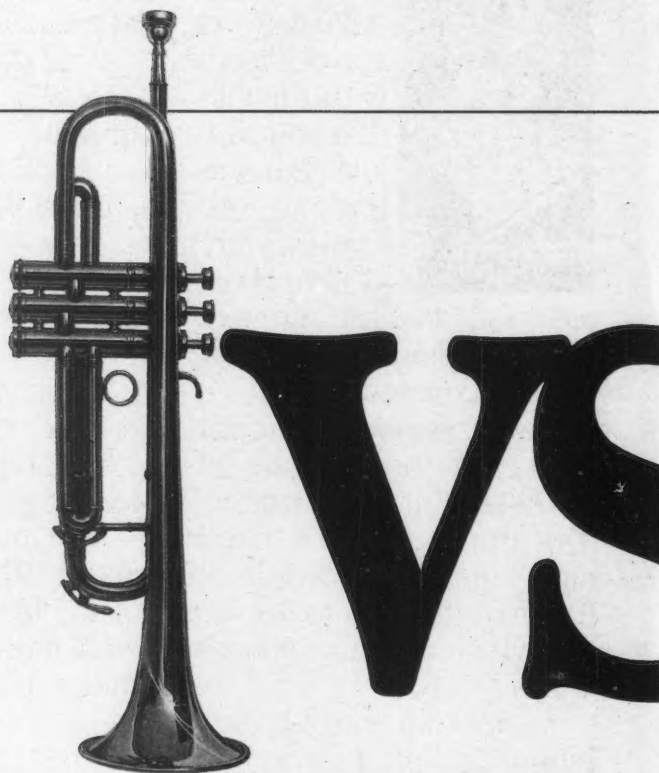
Inland wanted system users to be able to access the two computers for different functions, but it did not want the users to need separate terminals for each computer. This problem necessitated the second phase in implementing Inland's data communications network — the installation of a data PABX, — Balcer said.

Having used Gandalf products in phase one, and after researching the data PABX market, Inland decided to use a Gandalf Compacx IV. This unit now forms the heart of the company's network, and all data terminal equipment, except that which is interfaced with the multiplexer/modems, is routed through it. Users are now able to access whichever com-

puter they need for a particular function without having to use a separate terminal for each computer, Balcer said.

As a result of the data PABX installation, Inland is making fuller, more efficient use of its computer system, Balcer said. For example, if the system's data terminal equipment (DTE) were directly interfaced to computer ports instead of the Compacx IV, many ports would remain unused when the DTE was idle. These ports are now available for use by others.

Although the data PABX is currently functioning mainly as a port selector, Inland has plans to use it more as a port concentrator.



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## NEWS


**TURNAROUND  
TIME**

Larry Long

**Q** I arrived in this country from England in 1979 as a contract programmer based out of London. I enjoyed America so much that I decided to try and stay. At that time, I was contracted out to a company that was more than willing to try and hire me as a full-time senior programmer/analyst.

I then attempted to get a green card that would enable me to work for an American company indefinitely. However, in about a month, I will become an illegal alien because each country has an annual limit on green cards. As with many things of this nature, people in certain class-

es receive preference. Since I do not have a college degree in the American sense, I do not qualify for "third preference," which would give me a green card almost immediately. For any other preference level, the issuance would be at least eight months, and by that time, I will be an illegal alien.

The other way of qualifying for third preference is to be working in a career that is considered a profession. That is where you come in.

If anybody can confirm that members of the DP profession, in particular systems programmers, are indeed considered professionals, you can. I don't know how to convey to you how important it is to me to be able to stay in this wonderful country, but believe me, I am at my wit's end. I need to be able to prove to the Immigration Depart-

ment that I am a professional.

The term "professional" is used very loosely nowadays and is applied to everyone from dishwashers to engineers. There is no sacred list that christens those in certain disciplines as professionals. A professional has a marketable knowledge that usually takes years of study to acquire. The ancient and learned disciplines of law and medicine are considered professions, but not all attorneys and physicians are professionals. A professional is committed to upholding the highest standards of his profession and to performing services to the best of his abilities.

Systems programming is not an ancient and learned profession, but it is a modern and learned profession. If the immigration service doesn't recognize qualified computer specialists as professionals, especially systems

programmers, then they are blind to what is happening in the world today. If you meet the standards of your profession, then you are a professional.

**Q** I have eight years' experience with financial business applications and have a master's in business administration in computer methodology. I feel, however, that I would be happier in an academic environment. Some fields which interest me are ecological modeling, artificial intelligence research and linguistics.

An academic environment offers vacation, projects more interesting to me than "reformatting reports" and other benefits, but the pay is lower.

I have spoken to people at data centers of some local universities. Their work seems to break down to administrative, technical support for students and faculty and assisting with the research done by professors and their students.

Should my lack of formal education in science be a major obstacle? After all, I've had to learn about insurance, brokerage and so on.

Your friends have correctly categorized the three major areas of computer services in academe: administrative, educational and research. Jobs in administrative support are similar to those in the private sector. Salaries for university computer center personnel are traditionally lower, but vacation allotments are about the same as in the private sector. It's the professors who get summers off, not the administrative personnel.

You should have no trouble obtaining employment in an academic environment, but your experience and education may limit your access to AI research. AI hardware, software and concepts are completely foreign to people working with traditional business applications.

It's good to hear that someone is countering the "brain drain" by moving from the private sector to a college environment.

**Q** My employer, a bank, is considering the installation of data encryption equipment and has asked me for information regarding its usage and effectiveness in the industry. I have been unable to find any articles, statistics or case studies to contribute to the evaluation. I would appreciate any help.

In the scheme of things, cryptography has been surprisingly insignificant; therefore, usage statistics are scarce. However, the day is coming when encryption/decryption hardware and software will be standard on all workstations.

At present, we have a chicken-and-egg situation. Companies don't feel they need data encryption/decryption. And vendors are not going to make it available at a reasonable price until they do. Potential users, such as banks, are still reluctant to foot the expense of field installation of encryption/decryption capabilities.

The equivalent of more than one trillion dollars is electronically transferred via data communications each day.

That's a lot of vulnerability. Shortly after the first truly catastrophic financial disaster, bankers will demand cryptography, and vendors will supply it at reasonable cost, but probably not before then.

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## NEWS

## Builder raises productivity with application tool

DALLAS — A \$1 billion-a-year corporation here switched development tools in an effort to increase the productivity of its data processing staff.

Centex Corp. has operations in home building, general construction, cement and oil and gas. The company has an IBM 4341 mainframe running under the DOS/VSE operating system and, until three years ago, was using only command-level coding for programming in CICS.

At that time, Centex was using the Development Management System (DMS), IBM's programmer productivity tool. But according to Hal C. Bradford, manager of systems and programming, because DMS was not what he termed a "full-function" application development tool, development was taking longer than desired.

### Oxford's UFO

In an effort to make the DP staff more responsive to its users, the company began looking for another application development product. After studying three products, Centex chose Oxford Software Corp.'s User Files On-Line (UFO) tool, following a six-month trial.

The initial evaluation consisted of a tax reporting system composed of 17 on-line programs. It was begun in August 1981 and, according to Bradford, "By the end of September, we were on-line with the system in use, and that included our learning curve."

"UFO went in exactly as Oxford said it would," recounted Bradford. "It only took about two hours to get it started."

Bradford said UFO originally was intended to be a supplement to CICS, a way to do work quickly. But the company soon found UFO to be more flexible than CICS. He estimated that Centex now does 90% to 95% of its application development with UFO.

### 'Fast and accurate'

"UFO has allowed us to do several times the amount of on-line development we would have been able to do previously. It has been very fast and accurate," Bradford said.

"We sit down with a user and define screens while he's sitting there. Right then, we ask, 'Is that what we're talking about?' Or we talk to him and the next day have screens. Then one or two weeks later — three if it's a really difficult program — we have it ready."

"He talks to you today, and tomorrow you've got something for him to look at — to buy off on," he continued.

Besides getting results to the user more quickly, another advantage of UFO is an improved understanding of requests, Bradford said. "Sometimes, what the user tells you he wants is not what you think he is telling you," he said. "With the direct involvement afforded by UFO, you understand immediately."

Bradford said he could not place a dollar figure on the savings realized with UFO. "Our rationale in buying was to become more responsive to our users," he maintained. "It's difficult to assign a payoff to that kind of performance."

Bradford summed up his assessment of automation at Centex and the role that UFO

played. "The main benefit of automation is to give the user direct responsibility for the integrity of both his data and the documents from which the data is extracted."

### Less cumbersome

"In the past, it was cumbersome to batch things up, put them on a plane or a bus or in the mail, send them to a

location, then key punch, verify, balance them to batch controls. This procedure is no longer necessary in our on-line environment, and we have no keypunch work done," Bradford said.

"We have significant user involvement because we have found out it works more favorably for the user and for us," Bradford concluded.

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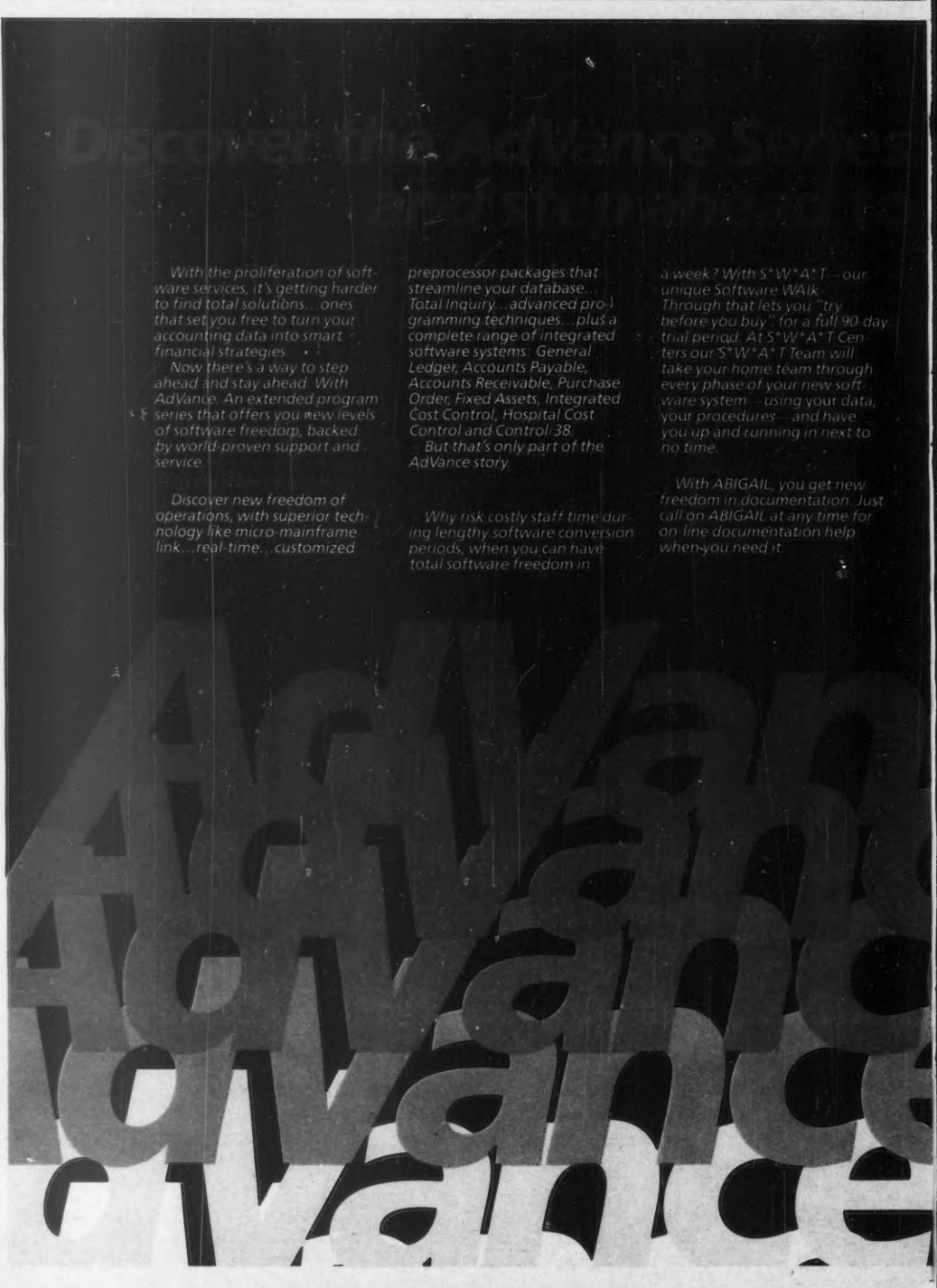
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## NEWS


**MANAGERS ON  
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Klein

LANE KLEIN has been appointed vice-president of management information systems for Beacon Co. in Boston. In her new position, Klein will be

responsible for corporate planning in addition to administration of management information systems at Beacon.

Klein formerly served as director of management information systems for Beacon, which is an investment builder and manager of office and residential properties.

Prior to joining Beacon in 1982, Klein was a partner in the management consulting firm of Temple, Barker and Sloane, where she specialized

in strategic and financial planning.

She earned her master's degree in business administration from Harvard University's School of Business in 1975 and is a graduate of the State University of California at San Francisco with a bachelor's degree in mathematics.

■ WILLIAM CROSS has recently been promoted to director of information systems for Seminole Electric

Cooperative, based in Tampa, Fla.

Previously, he held management positions with Electronic Communications, Inc. and NCR Corp. He also served four years in the U.S. Air Force as a data processing manager.

Before coming to Seminole, Cross served as director of management information systems for the Florida Operations Division E-Systems, Inc.

He earned a bachelor's de-

gree in economics from Kenyon College in Ohio.

He also received his MBA from the Florida Institute of Technology in Melbourne, Fla.

## Comten meet to be held Oct. 1-5

FORT LAUDERDALE, Fla. — The 23rd Comten Users' Exchange (CUE), for users of NCR Comten, Inc. data communications systems, will be held here Oct. 1-5.

On Thursday, Oct. 4, keynote speaker Robert Campbell, president of Advanced Information Management, Inc., will discuss trends in the evolution of network security technology and future security needs.

John Ratliff, vice-president of Sungard Recovery Services, Inc., will address the group on salvaging computer center disasters.

Registration for the week-long seminar is \$225 or \$100 for the Thursday session only.

More information about the seminar and registration is available from CUE President Bob Bowden, AT&T Communications, Piscataway, N.J. 08854; or Anne Madison, CUE Liaison, NCR Comten, 2700 Snelling Ave. N., Saint Paul, Minn. 55113.

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**ECZEL**  
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## NEWS



## CALENDAR

## WEEK OF SEPT. 30

OCTOBER 1-2, CHICAGO — **Computer Networks: Protocols, Standards and Compatibility.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

OCTOBER 1-2, ANAHEIM, CALIF. — **Successful Software Management.** Contact: Education Foundation of the Data Processing Management Association, c/o State of the Art Seminars, Department SSM, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510.

OCTOBER 1-2, MONTREAL, — **Dbase II.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Oct. 3-4 in Baltimore and Toronto.

OCTOBER 1-2, MONTEREY, CALIF. — **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

OCTOBER 1-2, SAN FRANCISCO — **Fundamentals of Data Processing for Administrative Assistants and Secretaries.** Contact: New York University, School of Continuing Education, Seminar Center, 575 Madison Ave., New York, N.Y. 10022.

OCTOBER 1-2, RALEIGH, N.C. — **Advanced Dbase II.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being

held Oct. 3-4 in New Orleans.

OCTOBER 1-2, WASHINGTON, D.C. — **Managing the Data Center.** Contact: New York University, School of Continuing Education, Seminar Center, 575 Madison Ave., New York, N.Y. 10022.

OCTOBER 1-2, NEW YORK — **Managing Systems Projects.** Contact: New York University, School of Continuing Education, Seminar Center, 575 Madison Ave., New York, N.Y. 10022.

OCTOBER 1-2, PRINCETON, N.J. — **The Information Center.** Contact: Data-Tech Institute, P.O. Box 569, Nutley, N.J. 07110.

OCTOBER 1-2, NEW YORK — **Local-Area Networks: Selection Guidelines.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

OCTOBER 1-2, WASHINGTON,

D.C. — **Communications and Compatibility for Micros to Mainframes.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

OCTOBER 1-2, WASHINGTON, D.C. — **Telecommunications I: An Introduction to Voice Communications.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

OCTOBER 1-2, PARSIPPANY, N.J. — **Linkage Concepts & Coding.** Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

OCTOBER 1-2, COLUMBIA, MD. — **Managing Warehouse Operations.** Contact: Center for Management Development, University of Maryland, College Park, Md. 20742.

OCTOBER 1-2, SAN DIEGO — **X.25 and Public Packet-Switched Networks.** Contact: McGraw-Hill, Inc., 1221 Ave. of the Americas, New York, N.Y. 10201.

OCTOBER 1-2, NEW BRUNSWICK, N.J. — **Dbase II.** Contact: American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

OCTOBER 1-2, WASHINGTON, D.C. — **Cashing In on the Videotex Market.** Contact: Phillips Publishing, Inc., Suite 1200N, 7315 Wisconsin Ave., Bethesda, Md. 20814.

OCTOBER 1-3, SAN FRANCISCO — **Data Communications Systems.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

OCTOBER 1-3, COLUMBUS, OHIO — **The IBM PC.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Oct. 1-3 in Toronto.

OCTOBER 1-3, CHICAGO — **Data Communications for Microcomputers.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

OCTOBER 1-3, HOUSTON — **Data Communications.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

OCTOBER 1-3, ROCHESTER, N.Y. — **Unix.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

OCTOBER 1-3, NEW YORK — **Unix Systems Internals.** Contact: Women in Data Processing, Inc., Suite 2008, 310 Madison Ave., New York, N.Y. 10017.

OCTOBER 1-3, WASHINGTON, D.C. — **Data Communications for Microcomputers.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

OCTOBER 1-3, BELTSVILLE, MD. — **How to Write and Produce User Documentation.** Contact: Center for Management Development, University of Maryland, College Park, Md. 20742.

OCTOBER 1-3, SAN FRANCISCO — **The Information Center: Concepts, Organizations and Implementations.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

OCTOBER 1-3, HOUSTON — **Microcomputer Systems: A Guide to Selection and Application.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

OCTOBER 1-3, WASHINGTON, D.C. — **DLI Application Programming.** Contact: Data Base Manage-

See OCT. page 46

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## Q. WHY ALL THE TALK ABOUT LOCAL AREA NETWORKS?

**A.** There's been a lot written about Local Area Networks (LANs). What's all the talk about? Why are LANs important? Should your company be looking into them? Is one kind of LAN better than another? The fact is, a lot of people, ourselves included, think LANs are going to play a key role in the total telecommunications picture for most businesses. Here are some questions and answers that might help you better understand LANs.

**Q.** To begin with, just what exactly is a Local Area Network (LAN)?

**A.** It's a system for moving information between devices located on the same premises. Now that calls for some further definitions. By "information," we mean data, voice, text, graphics or image. By "devices," we mean big computers, personal computers or other workstations, printers, telephones, scanners, files, sensors and actuators, and PBXs. By "same premises," we mean office building, manufacturing plant, hospital, campus or other geographically confined area. In short, and quite simplified, a LAN is one way of connecting all these devices to each other.

**Q.** There seem to be a number of different kinds of LANs. Why the variety?

**A.** The reason there are different LANs is because different work situations have different needs and different cost considerations. For instance, one type of network is capable of linking different kinds of computers, workstations and other devices throughout a building or campus. This allows for the exchange of information and the sharing of resources and large data bases. Then there's a need for a network specifically designed to interconnect personal computers. There's also the need for a special "industrial" LAN to meet the unique requirements of manufacturing plants. And there may be other networks developed to meet other needs.

**Q.** What if I want to link all the devices in my building?

**A.** IBM is developing a way to get all the devices in a building to communicate with each other using established computer and communications architectures. This will allow the mainframe computers, company-wide systems, smaller departmental clusters and even individual workstations to interact and share files, applications and peripherals.

We believe this general purpose LAN, utilizing "token-ring" technology, will provide the greatest flexibility and connectivity for different departments, workstations and systems. Other major benefits of this LAN technology will be very high reliability, predictability of performance, and greater overall network management capability.

The token-ring LAN will use the IBM Cabling System as its foundation. Currently being installed, the IBM Cabling System provides the immediate benefits of a common cabling solution for most IBM systems and workstations.

**Q.** Suppose I only need to connect personal computers?

**A.** We recently announced an IBM PC Network that allows a department, small company or remote location to interconnect IBM Personal Computers. This low-cost network lets PC users share files and printers, and send messages from one PC to another. The PC Network also lets users access application programs and data bases in larger IBM System/370 computers.

**Q.** What about a LAN for manufacturing plants?

**A.** We intend to offer an industrial LAN which will allow factory floor data collection and interconnection of robotic systems, machine tools, numerical processors and industrial computers.

**Q.** And if I wanted, could I connect these different networks to each other?

**A.** IBM has announced that its planned token-ring LAN will also act as a "backbone" connecting these different networks. Each network will have the ability to communicate with IBM System/370 host computers and applications.

**Q.** What if I'm still not sure which way to go?

**A.** Choosing a LAN is a business decision that will vary from company to company, and from department to department. Remember that LANs are just a portion of your company's overall telecommunications solution—a solution that should be developed in a planned, structured and manageable way. If you'd like some help in figuring out the answer that will best suit your needs today and in the future, call IBM.

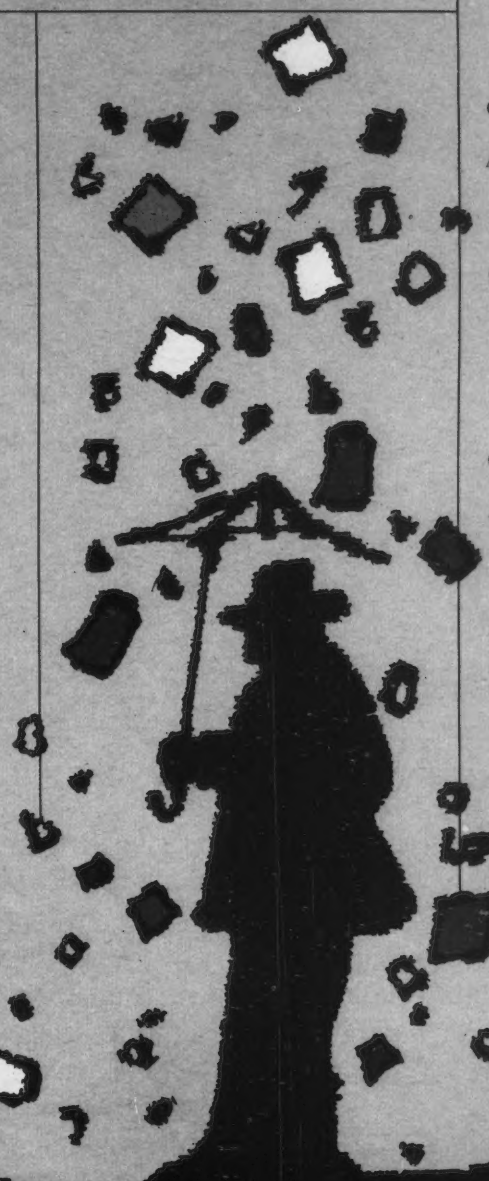
There's a lot more to be said about LANs and telecommunications. If you'd like a free copy of "Positioning Local Area Networks," call 1 800 IBM-2468, Ext. 90, or return the coupon.

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## NEWS

**OCT.** from page 42

ment, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

**OCTOBER 1-3, DALLAS — IMS/VS Message Format Service.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

**OCTOBER 1-4, NEW YORK — Managing with Micros.** Contact: U.S. Professional Development Institute, Department ABCDEF, 1620 Elton Road, Silver Spring, Md. 20903.

**OCTOBER 1-4, ANAHEIM, CALIF. — Autofact 6 Conference and Exposition.** Contact: Computer and Automated Systems Association of SME, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

**OCTOBER 1-4, SAN ANTONIO — System 1022/1032 Users Conference.** Contact: Software House, Inc.,

1105 Massachusetts Ave., Cambridge, Mass. 02138.

**OCTOBER 1-4, NEW YORK — The Information Management Exposition & Conference (Info '84).** Contact: Show Manager, Info '84, Cahners Exposition Group, 999 Summer St., Stamford, Conn. 06905.

**OCTOBER 1-4, CHICAGO — The Fourth Annual Conference on Control, Audit and Security of IBM Systems.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

**OCTOBER 1-5, SUNNYVALE, CALIF. — Capacity Planning and Modeling.** Contact: Institute for Information Management, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

**OCTOBER 1-5, NEW YORK — IMS/DC and Message Format Services Programming.** Contact: Sysed,

Inc., 35 W. 35th St., New York, N.Y. 10001.

**OCTOBER 1-5, PHILADELPHIA — Systems Design.** Contact: QED Information Sciences, Inc., P.O. Box 181, 170 Linden St., Wellesley, Mass. 02181.

**OCTOBER 1-5, BOSTON — Systems Analysis.** Contact: QED Information Sciences, Inc., P.O. Box 181, 170 Linden St., Wellesley, Mass. 02181.

**OCTOBER 2, ROCKVILLE, MD. — Engineering Project Management.** Contact: Center for Management Development, University of Maryland, College Park, Md. 20742. Also being held Oct. 3 in Columbia, Md., and Oct. 4 in Timonium, Md.

**OCTOBER 2, SAN MATEO, CALIF. — Video Display Symposium.** Contact: American Electronics Association, P.O. Box 10045, Palo

Alto, Calif. 94303. Also being held Oct. 4 in Minneapolis.

**OCTOBER 2, NEW YORK — Data Communications Protocols II — Introduction to SDLC Protocols and ADLC Comparison to BSC.** Contact: Women in Data Processing, Inc., Suite 2008, 310 Madison Ave., New York, N.Y. 10017.

**OCTOBER 2-3, HARTFORD, CONN. — Focus Query Language for End-User Personnel.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

**OCTOBER 2-4, SINGAPORE — Infomatics '84.** Contact: International Information Management Congress, P.O. Box 34404, Bethesda, Md. 20817.

**OCTOBER 2-4, CINCINNATI — Focus on Data.** Contact: Du Pont Statistical Seminars, Room X-40236, Wilmington, Del. 19898.

**OCTOBER 2-4, SAN FRANCISCO — How to Select and Implement a Telephone System.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

**OCTOBER 2-5, HARTFORD, CONN. — Focus Query Language for DP Personnel.** Contact: Data Base Management, Inc., 1075 Tolland Tnpk., Manchester, Conn. 06040.

**OCTOBER 2-5, PALO ALTO, CALIF. — Distributed Processing: Mini and Microcomputer Implementations.** Contact: Integrated Computer Systems, Inc., P.O. Box 45405, 6305 Arizona Place, Los Angeles, Calif. 90045.

**OCTOBER 3, NEW YORK — Vsam: Performance, Design and Fine Tuning.** Contact: Women in Data Processing, Inc., Suite 2008, 310 Madison Ave., New York, N.Y. 10017.

**OCTOBER 3-4, DALLAS — Data Communications II — Digital Communications Systems.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

**OCTOBER 3-5, MONTEREY, CALIF. — How to Build and Use a Data and Information Resource Directory.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

**OCTOBER 3-5, NEW BRUNSWICK, N.J. — Computer Network Architecture.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

**OCTOBER 3-5, CHERRY HILL, N.J. — Local-Area Networks.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

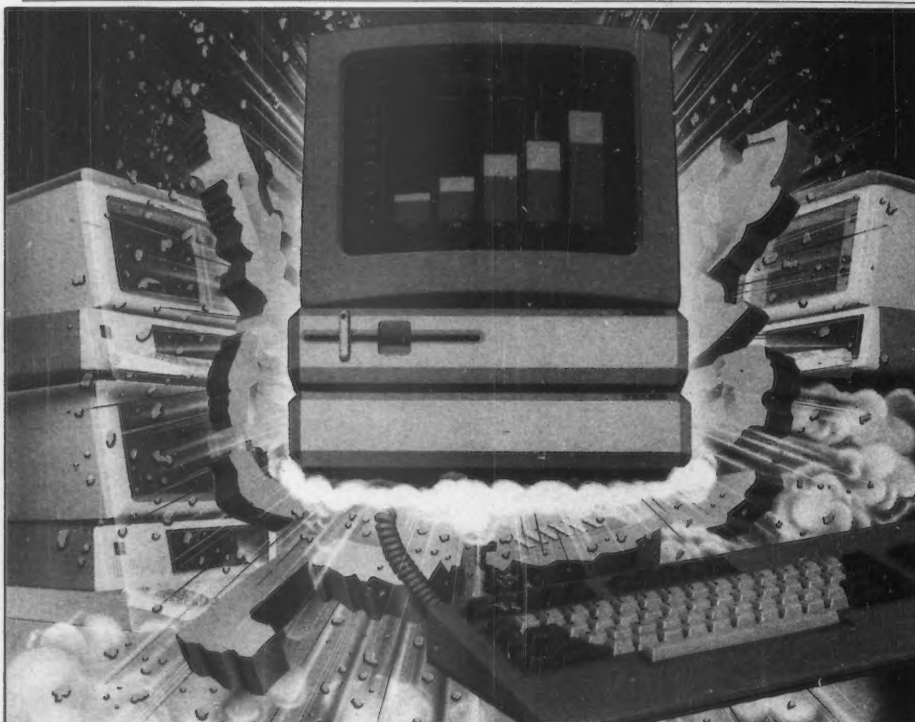
**OCTOBER 3-5, SAN JUAN, PUERTO RICO — Network Communications Protocols.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

**OCTOBER 3-5, DALLAS — PC World Exposition.** Contact: Mitch Hall Associates, P.O. Box 860, Westwood, Mass. 02090.

**OCTOBER 3-5, HASBROUCK HEIGHTS, N.J. — New-Generation PBX.** Contact: Data-Tech Institute, P.O. Box 569, 386 Franklin Ave., Nutley, N.J. 07110.

**OCTOBER 3-5, DETROIT — Networking Personal Computers.** Contact: Data-Tech Institute, P.O. Box 569, 386 Franklin Ave., Nutley, N.J. 07110.

**OCTOBER 3-5, BOSTON — Data Communications and Networking for Personal Computers.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.



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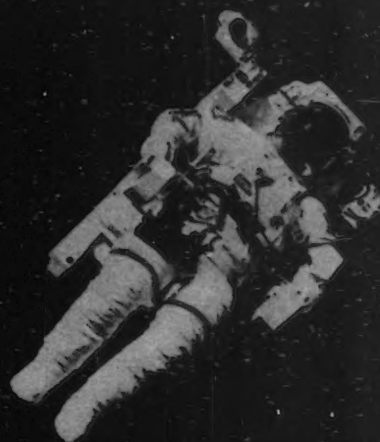
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# EDITORIAL

## Simplifying the cumbersome

Perhaps Apple Computer, Inc.'s television advertisement said it best.

The viewer first sees a personal computer, looking suspiciously like a machine of Apple's biggest competitor, next to which drops a weighty stack of documentation.

Then the camera pans on Apple's Macintosh, next to which a thin booklet of documentation gently floats from thin air to the tabletop. The voice overlay implores the viewing audience, "Now, you choose."

Although *Computerworld's* recent feature on documentation [CW, Sept. 10] focused on mainframe software documentation, as opposed to low-end, machine documentation, the message is the same: The market now demands simplicity of documentation without sacrificing a thorough working knowledge of a package or system.

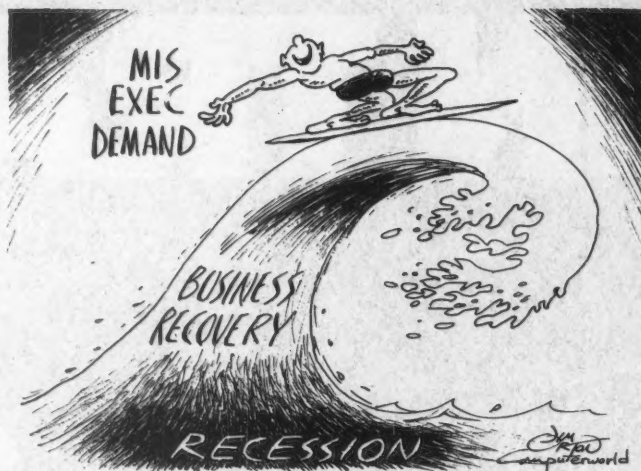
Further, as our feature revealed, vendors are increasingly targeting relatively unsophisticated end users, thus writing documentation for an audience that, in great measure, is turned off to DP jargon.

To anyone who has dealt with documentation in the past, even the most seasoned of computer professionals, this trend is a most welcomed one. It is also ironic that it took so long in developing, given the efficiencies of the so-called paperless information age. But the gains to be reaped, especially the burdens that can be lifted from MIS personnel who have been saddled with the responsibility of translating voluminous documentation to end users, will make it all worth the wait.

There are, however, some potential pitfalls in the drive to simplify the cumbersome. For one, there is such a thing as being *too* simple. As one DP manager pointed out, the relatively bulky documentation he purchased from a third-party vendor served his needs better than what IBM, which wrote the package, could provide. The third-party documentation, he found, provided more detail and was better indexed and illustrated. It seems, then, that users might not mind extra length if what is presented is easy to get through.

Another potential problem with simpler documentation is in its ability to anticipate problems the users will likely face. Getting the package or system up and running is fine, but taking the time to explain how one avoids operations problems is essential. Ask any manager whose system has crashed.

The pitfalls notwithstanding, it is encouraging to see the vendor response both to the widening audience of end users and to the training requirements of the MIS department. The best package or system in the world is useful only as much as its users understand it. Now that's simple.



Surf's up!

## LETTER

### Leave law to the court

In "A thorny problem for the court" [CW, Aug. 27], the somewhat disrespectful reference to the Vermont Supreme Court — "We wonder how [it] would have treated the town criers of old — as media or nonmedia defendants" — is not appropriate.

Concerning the First Amendment protection of computerized data bases, the court said, in part, (see *Greenmoss Builders, Inc. v. Dun & Bradstreet Corp.*, 461 A. 2d 414 Vermont 4/15/83):

"We are fully aware that, in certain instances, the distinction between media and nonmedia defendants may be difficult to draw. However, no such difficulty is presented with credit reporting agencies. . . . There is a clear distinction between a publication which disseminates news for public

consumption and one which provides specialized information [for substantial fees] to a selective finite audience."

The Vermont Supreme Court's ruling was quite proper as a matter of law. As this case represents a major constitutional issue, the appeal to the U.S. Supreme Court is also quite proper.

I leave the facts to the jury and the law to the Supreme Court. But you are quite correct in stating that information vendors must reexamine their obligations and responsibilities. It is well settled that a vendor of products or services owes a duty of care to his or her customers. Do you really believe that the First Amendment exempts vendors whose service is manifested on sheets of paper?

Michael H. Agranoff  
Hartford, Conn.

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## VIEWPOINT

### Invest in your career by joining a DP association



**THE DATA  
CENTER**  
John P. Murray

**I**n the information processing profession, there are any number of opportunities available to develop management skills through participation in one or more professional associations. The way to do this is to join and then take an active interest in the operation of the association.

Even though there are a number of information-processing-oriented professional organizations that offer technical and managerial services, it seems that only a rather small number of those who work in information processing join these organizations; and only a small number of those who do join take an active interest in the leadership of the organization.

Aside from the obvious benefit to be gained from joining an information processing professional association — that is, increasing your knowledge about the industry — there are two distinct additional, but often overlooked, advantages

*Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, published by Dow Jones-Irwin.*

which may, in the final analysis, be of the most substantial benefit to members.

The first of these benefits has to do with the opportunity to assume an increasingly active role in the management of the organization. It is usually not difficult to obtain an assignment to a committee or to secure an office in the organization.

#### Learn in a tolerant environment

Becoming involved in such an organization is a particularly good way for those beginning their careers to gain management skills and poise. Any mistake made in this setting is not likely to carry any long-term career consequences, as may be the case on the job. Better then, if possible, to learn as much as you can in a more tolerant environment.

It is usually the case that those who are just beginning or who are several years into their careers find themselves with limited opportunities to develop any experience in management. Let's face it, at that stage, we simply carry the spears and do what we are told; usually, our ideas or input are not eagerly sought out.

In a professional group, you can very quickly gain an opportunity to make a number of decisions on your own. Granted, many of these decisions will not be of great magnitude, but you do obtain the experience. Also, you have an opportunity to experience either the elation or the pain that results from your decisions, depending on their outcome. Most importantly, you get a chance to learn.

In addition, if you stick with it, you may get opportunities to speak at the meetings. In the beginning, these will be brief sessions, but they offer a very good means to overcome the initial fear of public speaking. The benefit, in addition to developing your poise, is the confidence that you will develop. When it comes time to make presentations in your own company, your poise and confidence will serve you well.

The other not-so-obvious, yet important aspect of belonging to an information processing organization has to do with associating with peers. We all tend to feel that the problems we face in an organization are unique. We sometimes think that all, or at least most, other information processing installations have a more understanding and supportive senior management, pay more money for the same work or at least never call anyone in the middle of the night with some esoteric operational or application program problems. Talking with other members of the association will often disabuse you of such ideas. In fact, you may come away feeling better about your own organization.

If you have an interest and are willing to donate some time (usually your organization will pay for the membership), you can realize a substantial return on the investment in a professional organization. Anyone who does not take advantage of the opportunities offered by joining and being active in a professional organization is missing a real chance to learn and grow.

### DG antitrust decision: An incentive to imitate?



**READER'S PLATFORM**  
Michael D. Scott

**O**n June 7, 1984, the 9th Circuit Court of Appeals issued an opinion that may very well result in a wholesale restructuring of the computer industry. Surprisingly, that decision has been given only lackluster coverage in the trade press [CW, June 18]. It has been almost totally ignored by those that will be most affected by it, namely, companies that market popular computer systems, like the IBM Personal Computer, and those that sell or want to sell computer systems compatible with those popular systems.

What I am referring to is the recent Data General Corp. antitrust decision. In that ruling, the appellate court unanimously held that DG was guilty of illegally tying its hardware and its operating system software by refusing to sell the software unless the buyer also purchased DG's hardware.

While the decision will have an immediate impact only on DG, the pronouncements of the court in reaching that decision may result in computer manufacturers being compelled to license their operating system software to all competitors wanting to sell compatible computer systems at reasonable license fees, or suffer the consequences of a treble damage antitrust suit.

To understand the impact of this decision on the industry as a whole, it is necessary to look at the back-

ground of the case. The plaintiffs, including Fairchild Camera and Instrument Corp. and Digidyne Corp., were companies that had developed hardware compatible with DG's Nova operating system. They did not want to expend the money necessary to develop their own operating system software and sought instead to buy or license DG's operating system software. DG refused to sell or license the software to the manufacturers or to their customers without a substantial license fee, unless the customer also purchased a minimum amount of hardware from DG.

The jury found that DG had sufficient economic power in the tying product market (software) to restrain trade appreciably in the tied product market (hardware).

The jury found that DG had sufficient economic power in the software market to force those desiring its software to purchase its hardware as well, but the jury's decision was overturned by the trial judge, who held that "the jury verdict cannot stand, because the evidence in this case does not support a finding of sufficient economic power appreciably to restrain competition in either [the market of all general-purpose minicomputers and microprocessors or the submarket of operating software which runs with CPUs utilizing the Nova instruction set]."

The 9th Circuit Court, in reversing that decision, held that the trial judge erred in requiring the plaintiffs to prove that DG had sufficient economic power to fix the price of its software. The court held that the burden on the plaintiffs was only to show that DG's software was so desirable or unique that some buyers would be induced to buy DG hard-

ware in addition to the software. The court further held that the plaintiffs had met their burden by showing that DG's software "was a most popular product," that the software had numerous advantages over competitive products and that it was viewed in the industry as "the best," as well as "the most comprehensive, compatible, field-proven and rapid." Finally, and perhaps most importantly, the court noted that DG had copyrighted its software, which proved it was distinctive, as well as imposing a legal barrier to reproduction by competitors. For these reasons, the appellate court found that the plaintiffs had sustained their burden of showing economic power and were entitled to judgment in their favor.

#### Take it to heart

Every hardware manufacturer should read this decision carefully and should take it to heart. If hardware suppliers can no longer control access to their operating systems, but are compelled to make them equally available at competitive license fees to all would-be competitors, there will be little economic incentive for a company to invest the money necessary to develop a unique or innovative system. Competitors will simply wait to see how commercially successful a system is. If it is a hit, there will be a flood of compatible products, all riding piggyback on the software R&D done by the innovator. If it is a flop, the competitors will turn elsewhere, leaving the unsuccessful innovator to shoulder the entire loss.

Think of how this decision would have affected the battle between Apple Computer, Inc. and Franklin Computer Corp. Instead of resorting to copying Apple's operating system

software illegally, Franklin could have simply requested a license from Apple.

If Apple refused, Franklin would have had an excellent antitrust claim. If Apple complied, then Franklin could have quickly entered the market with a 100%-compatible system (after all, it would be Apple's own software that Franklin was using) without incurring the considerable start-up expenses involved in developing its own operating system.

#### IBM also ripe for picking

And of course, Apple is not the only tempting target. IBM would be ripe for picking as well. In the past few months, there have been three well-publicized suits (or threats of suit) by IBM against Personal Computer-compatible manufacturers for alleged copyright infringement of IBM's Bios system software. In light of the DG decision, what exposure would IBM face if a compatible manufacturer approached IBM first and offered to license the Bios software and IBM refused?

While not denominated a copyright case, the DG decision may result in a de facto compulsory licensing requirement for any copyrighted operating system software. Such a requirement would radically change the structure of the computer industry by penalizing innovation and rewarding copycats.

Does the industry really want that result? If not, why is there no outcry against the rationale of the DG decision by anyone but DG? Why are vendors not lining up to file amicus briefs in support of a reversal of the appellate court decision or at least in support of a clarification of the "compulsory licensing" language of that opinion?

*Scott is a computer lawyer based in Manhattan Beach, Calif.*

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# SOFTWARE & SERVICES

## Generic vs. vendor-specific: Choosing a link

By Regie Kaufmann  
Special to CW:

As simple as the concept of microcomputer-to-mainframe interfacing seems to be, the reality of selecting the optimum software and making it work is proving more difficult than it should be for many users. The problems stem from the fact that there are two basic classes of product. One is generic and the other is vendor-specific. How do you decide which is best?

Prices and features vary widely among these two groups. Also, certain products are obviously unavailable to certain users; that is, a DP manager with a Software In-

ternational Corp.-based mainframe can only choose between generic and Software International links. Still, the more you know about the micro-mainframe link products, the easier your selection process will be.

Processing power, user-friendliness, application flexibility and price are the primary criteria for evaluating micro link software, whether generic or vendor-specific. Typically, the better vendor-specific packages win easily in the first two categories since they can be more closely integrated with their vendors' mainframe software than can the generic products.

Still, how closely integrated they are does vary from product to product, as does the degree of real user-friendliness. And it is not inconceivable that a good generic package can, with some custom-programming, be adapted to run better on a partic-

ular mainframe system than a not-so-closely integrated vendor product.

While user-friendliness is largely a result of close integration with mainframe command types and extraction features, it further includes directly user-oriented features like menuing, reporting and uploading tools. And it may even mean the exclusion of some bells and whistles that add cost but are not convenient — or even desired — by most users.

Application flexibility is important because it allows micro-mainframe links to take on increased responsibility as user experience grows. Today, link software is barely scratching the surface of its real potential. Because of this, features like spreadsheet format versatility and security and logging capabilities to let users input changes to mainframe files are essen-

See LINK page 62

■ Search and you shall find — Honeywell, Inc. has announced document management software for its DPS 8 mainframes/54

■ The 4.0 generation — Cincom Systems, Inc. has upgraded its Mantis application development system/54

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Kaufman is manager of product marketing at Software International Corp., a vendor of a microcomputer-mainframe link product.



**SOFTLINE**  
Gary Gulden

## Managing end-user computing: tactics

Ask most corporate information systems executives to describe the approach they use to plan and manage traditional data processing resources, and they will display a well-documented and highly evolved systems planning methodology. Usually it has been carefully conceived and implemented throughout their companies over the past several years.

They will also take particular pains to explain that this systems planning method-

See PLAN page 61

Gulden is a vice-president at Index Systems, Inc., a Cambridge, Mass.-based consulting firm. He is a regular contributor to Softline.

SOFTALK/PAUL GILLIN

## Quality assurance needs support

With the astronomical costs of maintaining poor quality software now becoming a critical issue, many companies have recently established bona fide quality assurance functions.

However, the newness of the concept and the difficulty companies are having in defining what the function should do has been a source of frustration for many quality assurance people. These technicians also face a unique barrier: Their job largely consists of identifying poorly designed and coded software, an activity that has not made them popular with some DP people.

With this in mind, a group of San Francisco-area quality assurance people have put together an organization to share ideas and experiences. Their initiative is worthy of note and deserves to be emulated.

The Bay Area Quality Assurance Association (Baqa) was founded in January and chartered just last month. Despite its young age, the group has grown

to more than 100 members. Interest appears to be increasing. Some members drive more than 100 miles to attend monthly meetings, officers said.

Baqa is "in many ways a support group," said Barbara Sundstrom, quality assurance testing manager at GTE Sprint Communications Corp. in Burlingame, Calif., and a member of the group. "[Quality assurance] is a small function, and it's very easy to feel isolated," she said.

Mac Patrick, manager of the quality assurance and testing group in payroll applications at Pacific Bell in San Francisco, added, "The whole aspect of reducing costs by building in quality up front has paybacks that are not as immediate as in some other areas. There's not a lot of glamour in it."

Because quality assurance is so new as a DP function, groups like Baqa are an ideal forum for sharing experiences. "Some people have four or five years of experience, and others are just getting

See BAQAA page 62

MVS/VS1  
Users

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## SOFTWARE &amp; SERVICES

## Document file system unveiled by Honeywell

PHOENIX — Honeywell, Inc. has announced a document management software system for its DPS series of 8M-byte, large-scale computers operating under Honeywell's Multics.

The Chemdata S.A. Texto package allows the user to create a document data base and cross-reference the stored documents using several user-defined key words, the vendor said.

Chemdata's Logotext option, which provides a user interface to Texto data bases, is also available.

Texto is designed so that nontechnical personnel can locate specialized articles, client and customer lists, bibliographic references or other groups of related textual data.

Texto data bases can be created in an interactive data entry session.

The Logotext command query language allows users to access Texto applications without knowing either Texto commands or the applications themselves. It also permits the user to list and save a set of commands for a routine procedure.

Texto is available for an initial annual license fee of \$35,000. The 12-month license fee for Logotext is \$13,200.

More information is available from Honeywell at P.O. Box 8000/T60, Phoenix, Ariz. 85066.

## Enhanced Mantis offered by Cincom

CINCINNATI — Cincom Systems, Inc. has announced Release 4.0 of its Mantis application development system.

According to a spokeswoman, Release 4.0 features an external "do" function that allows for the sharing of common subroutines, which reduces program size and improves execution efficiency and maintainability.

In addition, the quadrupling of the number of program variables in Release 4.0 allows Mantis users to access more data at any one time and handle more complex applications,

the spokeswoman said.

The enhanced release also features the ability to create and execute on-line Mantis programs in a batch mode, eliminating the need to write in a second language and reducing the usage of on-line resources to process batch-type applications, the spokeswoman said.

With expanded large-screen support, Release 4.0 also allows users to display data for reports on the complete line of IBM 3270 terminals.

Other features of Release 4.0 include a transfer facility that allows users to share Mantis entities; an en-

hanced interface facility that enables automatic data conversion on the CALL statement; a GET EQUAL statement that allows exact key matches; functions to support Cincom's TIS relational data base management system's Logical User View; and improved documentation, according to the spokeswoman.

Mantis runs on IBM mainframes under IBM's OS, DOS, CMS and MVS and is priced between \$30,000 and \$50,000.

Cincom Systems is located at 2300 Montana Ave., Cincinnati, Ohio 45211.

### SYSTEMS SOFTWARE

#### PACE APPLIED TECHNOLOGY, INC.

Komand/UCI

An interface that allows IBM MVS installations to account and charge for resources was announced by Pace Applied Technology, Inc.

Komand/Universal Charging Interface (UCI) provides an interface for accepting resource usage data from products such as Applied Data Research, Inc.'s Roscoe; Cincom Systems, Inc.'s Total; and Software AG of North America, Inc.'s Adabas, according to the company.

It also provides an interface for non-IBM hardware, manpower ac-

counting and office systems, inventory control monitor systems, as well as IBM's DOS, Digital Equipment Corp.'s VAX-11 machines and Honeywell, Inc.'s Gcos operating system.

The UCI data is used by other modules of the company's Komand DP chargeback system. The result, according to the company, is an invoice to users that includes usage from these resources along with that of the primary IBM or IBM's plug-compatible OS/VS1 through IBM's MVS/XA system and its peripherals.

Data center management determines the rate and reporting requirements that UCI applies.

Input is accepted from UCI data records created by the user's program. Detailed files of charges and utilization data can be produced and

summarized by account.

Cost of the program is \$2,500.

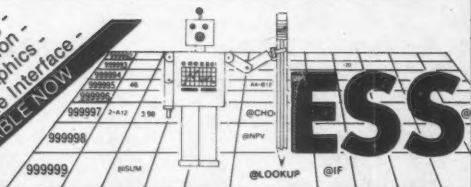
Pace Applied Technology, 7900 Sudley Road, Manassas, Va. 22110.

#### KOLINAR CORP. SQLExec

Kolinar Corp. has announced SQLExec, a programming tool designed for IBM VM/CMS operating environments that makes it possible to issue IBM SQL commands from two CMS macros, Exec2 and Rexec. SQLExec interprets extended dynamic commands, normally only available to the assembler programmer, to offer flexibility in manipulating SQL data bases, according to the vendor. An Exec preprocessor reportedly al-

Continued on page 59

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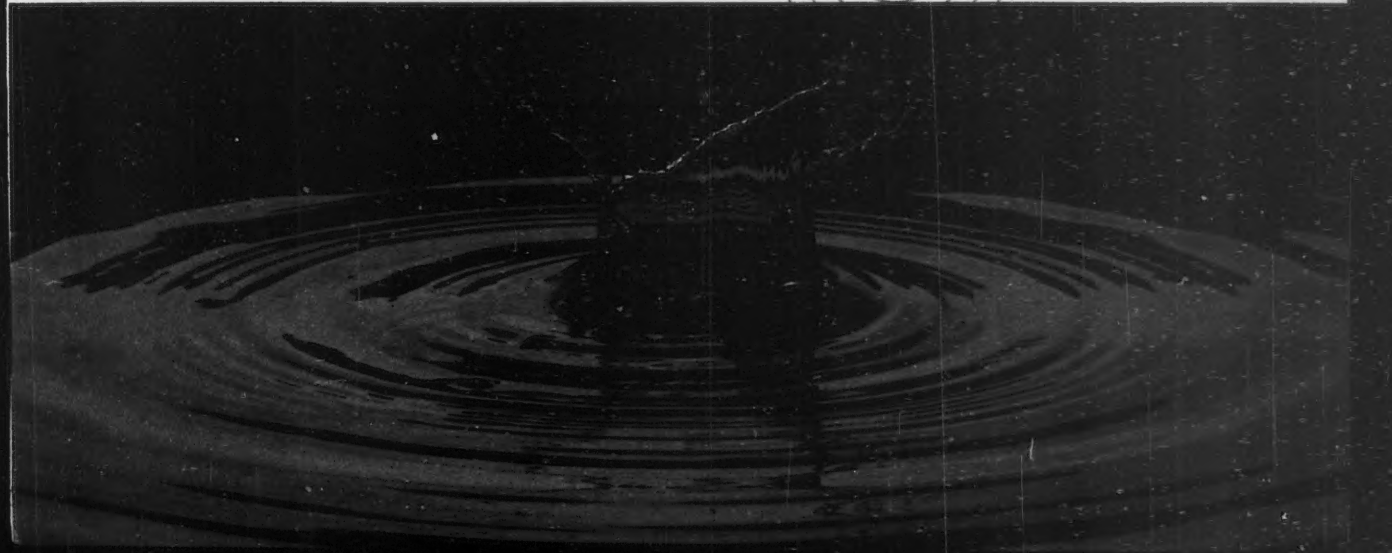
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## SOFTWARE &amp; SERVICES

Continued from page 54

lows for compatibility with the SQL interface.

It does not require operating system or data base modification.

It is priced at \$4,500, which includes first-year maintenance; maintenance thereafter costs \$675.

Kolinar, 3064 Scott Blvd., Santa Clara, Calif. 95054.

### ON-LINE SOFTWARE INTERNATIONAL, INC. Interest Release 2.3.3 for UFO

On-Line Software International, Inc. and Oxford Software Corp. have announced that On-Line's Interest testing and debugging programmer productivity tool for IBM mainframes under OS

and DOS operating systems in the CICS environment now fully supports applications written using Oxford's User Files On-line (UFO).

Interest now allows the UFO installation to test and debug all CICS applications, including non-UFO programs called from UFO procedures and those UFO applications that do not contain procedures, a spokesman for the vendor said.

UFO applications written using UFO Release 2.4.2 and higher are supported by this feature.

The price of Interest Release 2.3.3 for UFO is \$25,200 and \$21,000 for DOS.

On-Line Software International, 2 Executive Drive, Fort Lee, N.J. 07024.

### NETWORK SOLUTIONS, INC. DDN/MVS

Network Solutions, Inc. has announced interface software for IBM's MVS operating system that supplies the Department of Defense (DOD) accepted protocols — Transmission Control Protocol and Internet Protocol — that allow government IBM installations to participate in the DOD's Defense Data Network (DDN), Milnet and Arpanet networks. The IBM mainframes using DDN/MVS must also be equipped with a host-to-network interface.

The DDN/MVS package includes on-site surveys, on-site customized installation of software, operational testing, on-site integration of components, support maintenance and a toll-free service number, according to the vendor.

Commercial price of the DDN/MVS is \$29,000.

Network Solutions, Suite 201, 7700 Leesburg Pike, Falls Church, Va. 22043.

### EDP SYSTEMS, INC. Micropulse

EDP Systems, Inc. has introduced Micropulse, a package of hardware and software that permits two-way data communications between the IBM Personal Computer and Burroughs Corp. mainframes.

Micropulse reportedly incorporates Intercomputer Communications Corp.'s Intercom 1000 data communications hardware for use in the Personal Computer and an Intercom 102 terminal emulation capability.

The product provides a secured means for selecting data from host data bases and downloading it to the Personal Computer.

The Micropulse software resides both on the host and on the executing micro, EDP said. A menu-driven interface is said to be provided.

Data from the Micropulse information data base reportedly can be formatted

for use with microcomputer applications while it is being downloaded.

Micropulse is said to be available for use with all Burroughs mainframes from the B1000 upward. It is priced in a range from \$12,000, for the B1000, to \$25,000.

EDP Systems, 1801 S. Gadsden St., Tallahassee, Fla. 32301.

### WHELAN ASSOCIATES, INC. IWS/Sentry

Whelan Associates, Inc. has announced a software security device designed to monitor remote IBM Personal

Computer access to the IBM Series/1 small business computers.

IWS/Sentry is said to provide a multiple level of protection in conjunction with IBM's Intelligent Workstation Support (IWS). When calls are placed for IWS, IWS/Sentry reportedly obtains the access code entered by the user at the remote location. Communication is disconnected while the code is validated to a security file on the Series/1. If verification is received, the Series/1 automatically reestablishes the connection, the vendor said.

Continued on page 60

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## SOFTWARE &amp; SERVICES

Continued from page 59

The device requires an IBM Series/1 EDX Version 3 or above, IBM's PC-DOS Version 2.0 operating system, an IBM Intelligent Workstation Support installation and a Hayes Microcomputer, Inc. Smartmodem or equivalent for remote support.

The price is \$600.

Whelan Associates, Suite 3-A, Blue Bell Three, 723 Skippack Pike, Blue Bell, Pa. 19422.

#### GREENE SOFTWARE EMS/34

Greene Software has announced security software for the IBM System/34 using IBM's Mapics. The Extended Mapics Security system (EMS/34) allows each Mapics menu option to be individually secured.

EMS/34 includes Help screens and password reports. The software is written in RPG II and includes all source code. It was designed also to take advantage of multiple Mapics, the vendor said.

Price of the EMS/34 security package is \$395 per CPU.

Greene Software, P.O. Box 23, Victor, N.Y. 14564.

#### INFORMATION PROCESSING TECHNIQUES CORP. Unix Version 7 port

Information Processing Techniques Corp. has introduced a port of the Unix Version 7 operating system to Data General Corp.'s desktop Eclipse minicomputer.

The port is said to extend Unix

Version 7 to the entire line of DG's 16-bit Eclipses. The port includes most of the utilities provided in Version 7, the company said, as well as support for a number of languages.

The price is \$2,500.

Information Processing Techniques, 1096 E. Meadow Circle, Palo Alto, Calif. 94304.

#### APPLICATION PACKAGES

##### SOFTOOL CORP.

###### Four software packages

Softool Corp. has announced that it has signed an agreement with Data General Corp. of Westboro, Mass. that allows four computer-aided software engineering packages to be available on DG's 32-bit Eclipse MV/Family systems.

These packages work under DG's AOS/VS and MV/UX operating systems. The four packages are: Change and Configuration Control (CCC); Programming Environment (PE); Digital Equipment Corp. VAX-11 Fortran to DG Fortran 77 automatic conversion tool; and DG Fortran 5 to Fortran 77 automatic conversion tool.

According to a spokesman for the vendor, CCC is a software management tool that keeps track of changes and configurations of source code, object code, test data, documents and drawings and can support programs in any language.

PE is a collection of tools that al-

lows users to compose application programs from prefabricated code and to produce products that are checked out, documented and standardized. PE has nine components that can be purchased in differently configured subsets, the spokesman said.

Permanent license prices are: \$30,000 for the CCC package, \$30,000 for the entire PE system and \$4,000 each for the automatic conversion tools.

Softool, 340 S. Kellogg Ave., Goleta, Calif. 93117.

##### SAGE DATA, INC.

###### Sagemap; Sage Orgchart; Sagedraw; Sagegraf

Sage Data, Inc. has announced an agreement with Interchart, Inc. to offer three graphics application software products. These three menu-driven products use Issco Graphics, Inc.'s Tell-a-graf software on IBM and Digital Equipment Corp. mainframes, DEC's VAX-11 computers and can interface with the IBM Personal Computer.

Sagemap produces color and pattern coded maps of business data for any custom geographic region. After optionally reviewing the information which has been entered, Tell-a-graf is automatically executed to produce a presentation-quality map.

Sage Orgchart maintains organization information, produces organization charts and conducts personnel simulations. It can construct an organization matrix while allowing users to select subsets for viewing and

plotting.

Sagedraw is a graphics system that uses digitizing tablets and/or cursor control keys on a color graphics terminal. It allows users to produce logos, illustrations, maps and charts. When the graph is finished, Tell-a-graf produces the final presentation chart.

Each of the packages are available for license fees of \$15,000.

Sage Data has also announced a full-screen version of its Sagegraf, a menu-driven graphics package for IBM mainframes which also uses Tell-a-graf. The full-screen version option adds \$6,000 to the Sagegraf price of \$12,500.

Sage Data, 104 Carnegie Center, Princeton, N.J. 08540.

##### SATCOM, INC. Prodstar MRP

Satcom, Inc. has announced that it will be the exclusive U.S. marketer of Prodstar Production Software, S.A.'s Prodstar Manufacturing Resource Planning (MRP) package.

Prodstar MRP runs on Digital Equipment Corp. VAX-11 computers, Hewlett-Packard Co. HP 3000s, Texas Instruments, Inc.'s 990 Business series, Philips Data Systems, Inc.'s P4000 series, both the IBM Personal Computer XT and AT, the HP 150 and DEC's Rainbow Plus.

Prices of Prodstar MRP are \$35,000 for the VAX-11, HP 3000, TI 990 and P4000 computers and \$9,900 for the microcomputers.

Satcom, Box 68, 11 Diamond Court, Glen Rock, N.J. 07452.

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Nicholas Nierenberg  
Unify Corp.  
Gary Morgenthaler  
Relational Technology  
Irene Nesbit  
Nesbit Systems  
Bruce Weiner  
Digital Research  
Donald O'Shea  
Amdahl Corp.  
William Joy  
Sun Microsystems, Inc.  
Daniel Lankford  
AT&T Technologies  
Karan Kauppila  
Handle Corporation

Esther Dyson  
EDventure Holdings, Inc.  
John White  
Interactive Systems  
Andrew M. Seybold  
Seybold Organization  
Ann Winblad  
Open Systems  
Bob Whitecotton  
AT&T Information Systems  
Joseph Alsop  
Data Languages  
Larry Dietz  
The Alec Group  
Mike Azzara  
Computer System News  
Pat Zilvitis  
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## SOFTWARE &amp; SERVICES

**PLAN** from page 51

odology is "business-driven," contains specific links to business strategy and is characterized by heavy participation from line management in each operating unit in which systems planning is performed.

Ask these same managers to describe what they use to plan for and manage end-user computing resources in their organizations, and you will get an entirely different set of responses:

- "How can you plan for something that is essentially ad hoc?"
- "We just continue to add computing power and support resources to our information center as long as demand for end-user computing exceeds supply and as long as our user departments are willing to pay."

What is absent from these responses is a reference to a "business-driven planning methodology." To most, this inconsistency is not troubling. But consider the following for a moment: End-user computing is showing the highest percentage growth rate in the industry. Many experts believe it will represent half of the information systems expenditures by 1990.

Managers who are planning end-user computing in an informal manner not clearly connected to business objectives are heading for trouble.

Most organizations we see today manage end-user computing with a strategy composed of three elements:

- A technology strategy that provides enough mainframe and microcomputer power to satisfy user demand, while placing rational limits on proliferation of technologies.
- A support strategy aimed at making end-user technology as accessible and easy to use as possible.
- A management policy aimed at enforcing minimal cost/benefit criteria, providing minimal protection to the corporation against improper usage of the computer and protecting end users from their own mistakes.

There are lots of good three-legged strategies around today, and they operate effectively as far as they go. But they don't go far enough. All of these three-legged policy structures share a common, but seriously flawed, premise: All user needs are created equal, and "the invisible hand" of the marketplace within the company can be trusted to allocate end-user computing resources.

A quick look at end-user computing resource consumption in most companies will illustrate why a philosophy based on the "invisible hand" is not good enough. In these companies, about three-fourths of current end-user computing and future demand is traceable to middle to low analysts working in the finance and administration functions. We call this utility end-user computing.

While few can argue with the need for improving white-collar productivity, senior management has begun to wonder if what is really being created is a costly "analyst's sandbox."

Increasingly, senior managers are asking what they are getting in terms of business value for all of their investment in end-user computing. Many executives would prefer to see active use of their decision support systems or information centers by managers in line functions.

In point of fact, there are two varieties of end-user computing applications: utility applications that typically have some degree of efficiency benefit for the organization and "high-value" applications that can make a genuine and noticeable impact on the business success of the organization.

You can always count on the analysts to consume all the end-

user computing resources a company can afford to provide. Consequently, information systems needs to develop some techniques to detect and stimulate the high-value opportunities for end-user computing in the areas where the invisible hand is unlikely to reach.

Thus, the fourth leg to a sound strategy for managing end-user computing is what one could call a market strategy — one which recognizes that some user needs (markets) are substantially more important to the business and that a single, supply-oriented approach to managing end-user computing will not necessarily suffice.

At least two approaches for managing end-user computing are need-

ed: one for utility use and the other geared to stimulating high-impact use of end-user computing in business areas that might not take to end-user computing naturally.

But how does one detect the elusive markets for high-value applications? The critical success technique (CSF) is by far the most powerful technique available for detecting high-value applications of end-user computing to support managers [CW, June 25].

CSF provides clear direction toward the critical managerial and decision-making areas of a company and provides a proven vehicle for the direct participation of managers in defining vital information needs.

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## SOFTWARE &amp; SERVICES

**BAQAA** from page 51

started," Sundstrom said.

In most cases, quality assurance people are still searching for direction in how to set up and run their functions. Perhaps out of empathy, the more experienced members have been very open about sharing their knowledge, Patrick said. "The companies that are just starting up may be able to come back and help us someday," he said.

Baqaa first came together through announcements at vendor-sponsored users group meetings. News of the organization spread quickly, largely through word of mouth. Members pay \$40 per year, which finances the monthly meet-

ings. Guest speakers are often invited.

There is no reason you cannot start such a group yourself. The important thing is to get enough members together at the first meeting to form a start-up committee. Ten or more people is a good foundation, Sundstrom said.

You should put together a mailing list, establish a charter and put someone in charge of handling the logistical details of the meetings, she said. Baqaa also expects to publish a newsletter.

Baqaa has offered to provide advice for organizations just getting started.

Its address is P.O. Box 9378, San Rafael, Calif. 94912.

**LINK** from page 51

tial for real flexibility.

As with any product, optimum price/performance is the goal of link product evaluations. But in this case, the pricing issue is more complex. For one thing, the micro-mainframe interface market is new and untested. For another, product price structures vary widely among competing vendors.

For most micro links, price typically includes some hardware and some software. Hardware consists of one or more printed-circuit boards for interfacing the user's micro to the mainframe or front-end controller to provide IBM 3270 emulation capabilities.

Software is needed to facilitate micro user interaction with the appropriate mainframe files. This ranges

from micro screen handling intelligence for menus and Help screens to interfacing and integrating mainframe files and commands with micro-resident programs.

The key to cost efficiency typically lies in how much extra software is required and where the software resides. Because micro-mainframe links represent an entirely new market segment, the higher the start-up cost, the more difficult for new users to feel comfortable with their own productivity, just as it is more difficult for companies to cost-justify limited-use micro link installations.

**Start-up costs**

For generic links, start-up costs take into account the per-user software pricing plus the estimated cost of new program development necessary to tailor the software. The obvious trade-off applies here: The closer the integration and greater the processing power desired, the more program development must be undertaken.

Generic systems can be brought up in an evolutionary fashion, but there is still an amount of initial development to tie micro links into the mainframe software. In vendor-specific links, start-up costs and performance details are more easily identifiable. Some vendors require significant additions to mainframe software as well as to micro-resident programs, and these can mean capital outlays of as much as \$75,000.

These costs can burden micro link start-up operations. Also, potentially troublesome software added to the mainframe may impede micro link performance at a time when users need maximum confidence. As a rule, the less software that must be added to the mainframe, the better.

Performance is as important as price. The easier and faster micro users can extract and manipulate mainframe information, the more power they have to be productive. Generic link packages typically provide no more than basic file transfers to micros; the user then has to distill, organize and format file contents into meaningful contexts.

Oddly, some vendor-specific links are not much better. The best measure of data extraction power is in the methods that micro operators use to get at their mainframe data. Micro-resident commands should look and work the same as basic mainframe commands.

**Application flexibility**

Application flexibility also contributes to user-friendliness. The more things the micro user can do with the least effort, the more likely the micro-mainframe link is to be used productively.

Links should not be limited to just one spreadsheet type, for instance, because to micro users, spreadsheet familiarity is an important asset. By incorporating Software Arts, Inc.'s Data Interchange Format universal formatting technique, link products give users the ability to format mainframe data into any of several popular spreadsheet programs.

Micro link flexibility should be geared to future applications, too. Early user activities will typically revolve around downloading of data, spreadsheet manipulations and report generation. Once users gain familiarity with these operations, some may want greater power and sophistication.

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# COMMUNICATIONS

## Breakup opens PBX market Buyers advised to shop with an eye for service

By Kathleen Sullivan  
CW West Coast Bureau

MENLO PARK, Calif. — With the breakup of AT&T, many companies have jumped into the market for private branch exchanges (PBX), promising new state-of-the-art products.

In consideration of these products, consultants caution would-be users to look beyond promised technological capabilities to more traditional considerations. Chief among these concerns should be the supplier's reputation and ability to service what it sells.

Divestiture has brought new meaning to the phrase "customer support," said Thomas Cross, president of Cross Information Co., a Boulder, Colo.-based market research firm. In the idyllic past, he said, customers relied primarily on a single source for all their communications needs. But that situation has changed. And many companies, he said, are not prepared to handle the range of services that users have come to expect.

Michael Levine, a consultant with the Eastern Management Group, a N.Y.-based market research firm, pointed out that customers often "get caught up in the technology" when shopping for a PBX. It's important to remember that, in purchasing a PBX system, a company is buying service as well as hardware, he said.

Harry Newton, president of the Telcom Library, a telecommunications research and publishing house located in New York, agreed that service was a critical factor in analyzing the PBX market [CW, Aug. 27].

"I've seen the same two phone systems installed in two different companies," he said. "One company loved it, and the other hated it. And the only difference between the two [installations] was the service company."

According to these consultants, customers should look into a company's service track record by talking with some of its customers. It is also important, the analysts noted, to find out what kind of service will be available in the geographic area in which the PBX will be installed.

In addition to the availability of service support, other factors to be considered before purchasing a PBX include:

- Find out if the company can actually deliver the system. Is it installed anywhere? Does it work? Does the PBX's capacity meet the claims of its manufacturer? Does its applications software dovetail with your company's requirements?

- Talk to a company that is already using the PBX. Is it working for them? Find a company that is in the same business as yours with roughly the same communications requirements.

- Conduct a thorough analysis of your company's needs before deciding on a PBX. Predicting your firm's future communications needs is a difficult task, the analysts agreed, yet it is a crucial step. Begin by looking at how your firm has met its requirements in the past. Then, ask what additional features would help improve the business in the future.

- Buy a system that will meet your company's growth projections for data as well as for voice communications. Newton recommended that a firm choose a PBX that will meet its needs even if the firm doubles in size within a two-year period. On the other hand, Levine warned companies against "getting wound up" in the new technologies and choosing systems that far exceed their requirements.

- Take special care in analyzing the PBX offerings of start-up companies. In addition to verifying the availability and reliability of its technology, it is important to judge the long-term financial health of the company itself.

- Request bids from several vendors. If your company is choosing from a variety of systems that perform equally well, "price can be a gravitating force," Cross said. Consider other financial alternatives as well, including renting or leasing a system, he suggested.

- If your company decides to use a consultant, check out the consultant as carefully as you check out the PBX firm. Newton suggested. Some consultants in the telecommunications business are "on the take," he warned, and receive money from vendors when a client purchases a PBX system. Although Newton added that "not all consultants and not all vendors" are involved in the practice, the situation can create problems.



DATA STREAM  
John Dix  
CW Service Editor

## FCC OKs resale of AT&T services

Recently, the Federal Communications Commission lifted restrictions to allow AT&T's nonregulated subsidiary, AT&T Information Systems, to resell the regulated long-distance services of AT&T Communications. The ruling applies to all basic interstate services provided by the long-haul carrier, including direct-distance dialing, Wats and private lines.

Resale in this context simply means AT&T Information Systems can now act as a middleman between users and their long-distance communications carriers. The company does not intend to become a resale carrier — such as U.S. Tel, the carrier United Telecommunications, Inc. acquired earlier this year — which would require it to establish a network of leased lines and try to eke out a living by reselling that capacity for a profit.

While the company is reticent about how it plans to exploit the new ruling, two plans of action come to mind.

In the more obvious one, it is likely that Information Systems will use its newfound freedom to position itself as a single source supplier for telecommunications equipment and services. In this capacity, the company would offer the bundled package to leverage sales of its private branch exchanges (PBX) and take a small percentage profit from the long-distance business that it arbitrates for the user.

Those users would be expected to pay more for their long-distance services than they would if they procured them on their own. But if evaluation and consulting services are part of the package, users might be able to justify its cost, given the number of interstate options available now, especially if its use obvi-

See AT&T page 67

■ Giltronix Corp. has unveiled an automatic switching device that provides for peripherals sharing/67

■ Users of Digital Equipment Corp. VAX-11 superminicomputers running VMS or RSTS/E can now support Digital Management Group Ltd. DMG/NET software/67

### INSIDE

Controllers/67

Software/67

## Converter gives Xyplex users access to IBM mainframes

Xyplex, Inc. recently unveiled a protocol converter that gives users of its terminal switching system, the Xyplex system, access to IBM mainframe computers. The company also announced a product that is said to provide IBM Personal Computer users with access to IBM mainframes and Digital Equipment Corp. VAX-11 superminicomputers.

To provide access to an IBM host for VAX-11 users that have the Xyplex system, the company has introduced the XP-3270 interface unit. This device supports up to seven asynchronous Ascii terminals and, through protocol conversions, appears to an IBM host as an IBM 3274 controller in either a bisynchronous or Synchronous Data Link Control environment.

The XP-3270 is physically connected to the IBM host via a line that supports communications at speeds of up to 9.6K bit/sec. It will be available in the third quarter of 1984 for \$7,700.

The IBM Personal Computer controller, XP-IPC, is a single, standard-size peripheral controller board that emulates an RS-232 communications port and is said to interface the Personal Computer directly to the Xyplex system. This is said to increase the potential speed of the communications port transfer to more than 100K bit/sec. The XP-IPC will be available in fourth-quarter 1984 for \$960.

More information is available from Xyplex at 100 Domino Drive, Concord, Mass. 01742.

## Bell Labs sets transmission rate records using low-loss fiber

STUTTGART, West Germany — Bell Laboratories is pushing silica to its limit, reducing this basic component of sand to hair-thin strands of ultrapure glass that can carry high-speed, unboosted signals at ever-increasing distances.

At the European Conference on Optical Communications held here earlier this month, Bell Labs reported that in experiments in its Holmdel, N.J., facilities, it had set two separate world records for information transmission over a fiber-optic cable made possible by a system that uses a low-loss fiber as well as a laser light source.

The company reported that in one experiment, a 420M bit/sec signal was transmitted unrepeatable over a 203-km fiber-optic cable.

In the second experiment, a 2G bit/sec signal was sent unrepeatable over a distance of 130 kilometers, the company said.

The low-loss fiber, which uses a new cladding around its core, reduces light loss to such a degree that the signal emerging after traveling a distance of 200 kilometers is "10 times stronger than it would be through most previous fibers," according to the company.

"This fiber could help make it possible to reduce [significantly] the number of signal boosters needed in long-distance lightweight communications systems or even eliminate them in certain cases," reported Rich Wagner, a supervisor in the undersea lightweight system development department.



# The Newest HP 3000.

It's the new, low-cost Series 37 Office Computer—the ideal system for a branch office, department or small business. Because in this little box comes all the power of an HP 3000 computer.

On the one hand, the HP Series 37 Office Computer can handle your distributed data processing needs, such as data entry and retrieval, data base management, accounting, even batch processing.

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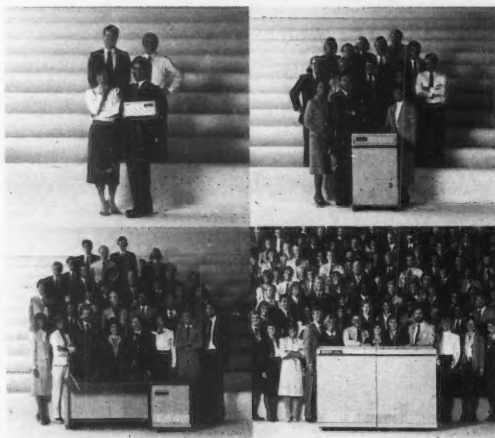
Center, the Series 37 integrates all your office information needs.

It provides a common interface for HP's Touch-screen Personal Computer and The Portable, as well as IBM PCs.

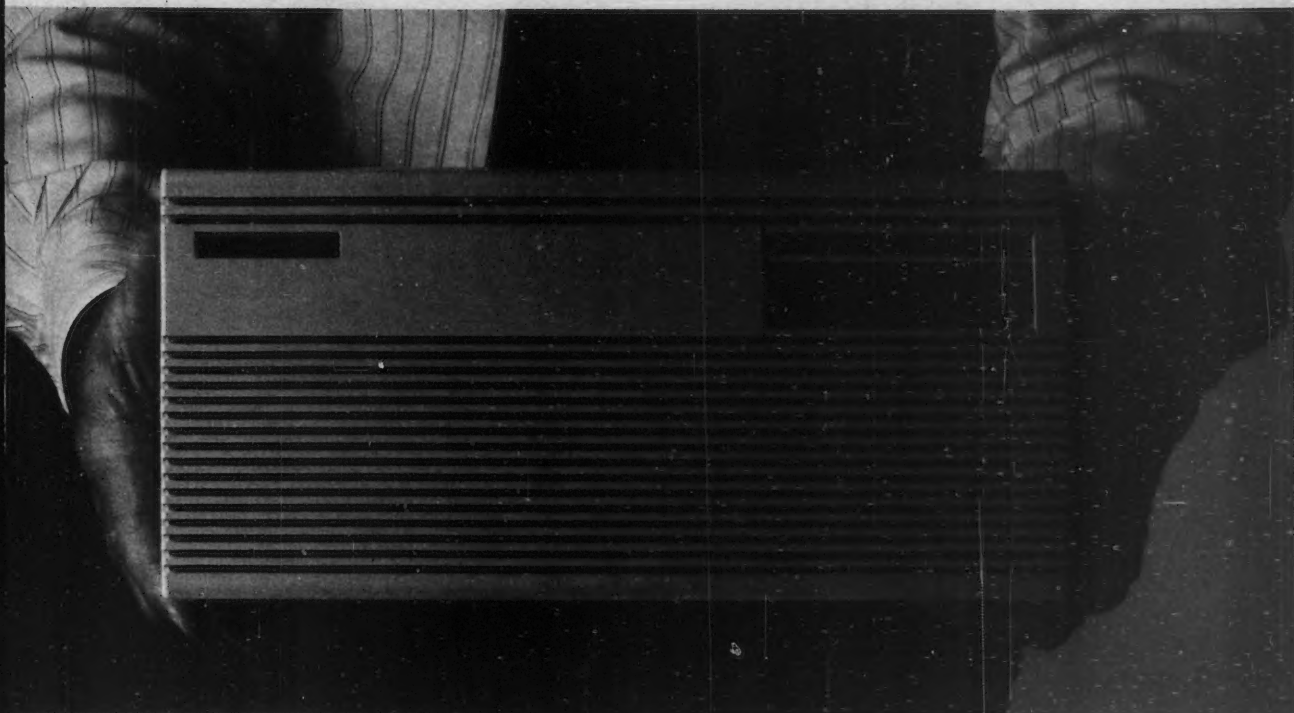
Rather than just acting as "dumb" terminals, they can interact directly with the Office Computer, using simple personal computer commands.

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mail, links to your mainframes and other HP 3000s. Word processing. Graphics. Business software for financial planning. And



The HP 3000 family. These fully compatible business computers can take you from the Series 37 to a 400-user Series 68 distributed mainframe. Without any change in your software.



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In Europe, write Michael Zandwijken, Hewlett-Packard, Dept. 003205, P.O. Box 529, 1180 AM Amstelveen, The Netherlands.

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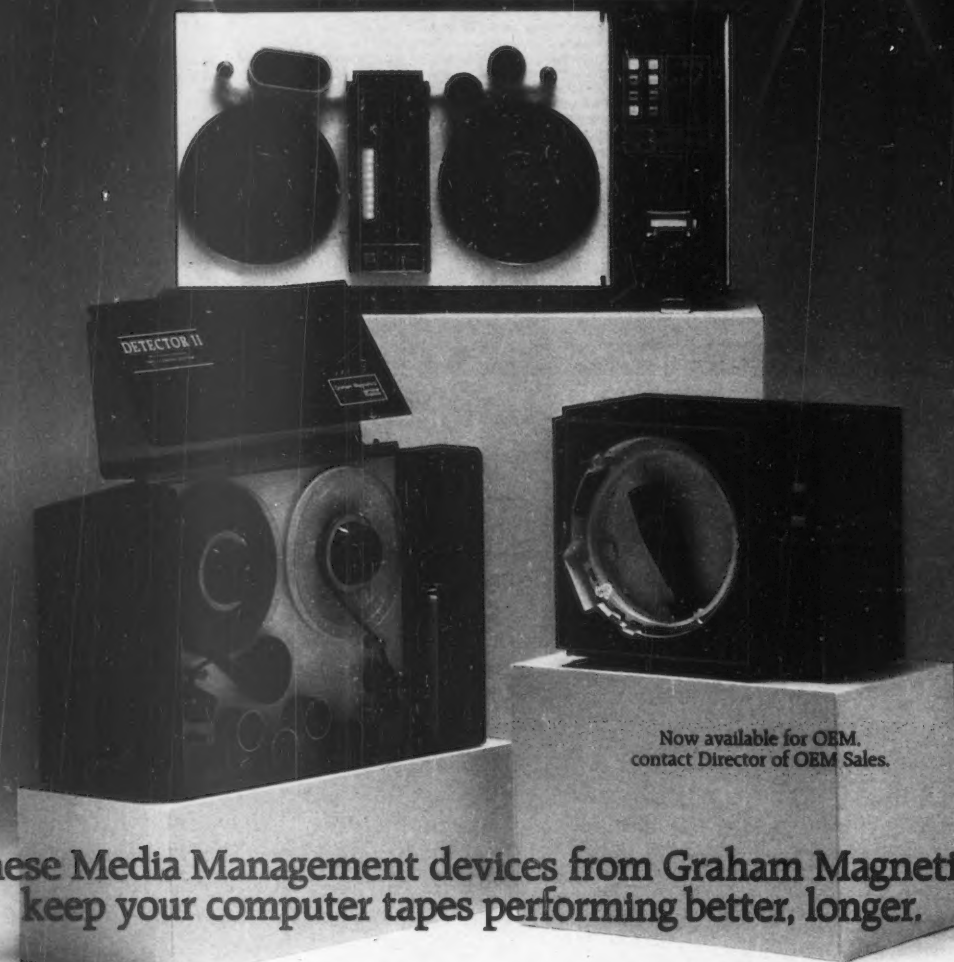
**Productivity. Not Promises.**



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PACKARD**

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## COMMUNICATIONS

## CONTROLLERS

GILTRONIX CORP.  
PSD

Giltronix Corp. has introduced an automatic switching device that reportedly allows up to 14 computers or terminals to share a single peripheral without the need for special cables, software or keyboard commands.

The Peripheral Sharing Device (PSD) is said to scan each of its channels sequentially for requests to connect to the common peripheral. The PSD responds to actual transmitted data rather than to handshaking signals, the vendor said.

Some of the PSD's features include front-panel LED monitors that indicate the status of six RS-232 lines, digital display of selected ports, slide switch at each port allowing for support of data terminal equipment or data circuit equipment, user-selectable time delays and integral line driv-

ers and receivers.

PSD prices start at \$395 for a three-port model. Three-, five-, seven- and 14-port models are standard. *Giltronix, 3780 Fabian Way, Palo Alto, Calif. 94303.*

ADVANCED COMPUTER  
COMMUNICATIONS CO.  
IF-370/DDN

Advanced Computer Communications Co. (ACC) has introduced an interface that attaches IBM 370, 4300 and compatible mainframes to the Defense Data Network, a packet-switching network designed for the U.S. Department of Defense.

IF-370/DDN is said to connect to the network through X.25 and HDH protocols.

The IF-370/DDN hardware is said to support the lower layers of the Defense Data Network protocol and is attached to IBM hosts through their block multiplexer channel, providing a high-speed, bit-synchronous serial line to the network. The link is said

to be capable of handling data rates of more than 1.5M bit/sec.

The IBM channel interface and network interface subsystems are interconnected via the Versabus, which can transfer data at up to 20M byte/sec.

The IF-370/DDN interface sells for \$40,000.

*Advanced Computer Communications, 720 Santa Barbara St., Santa Barbara, Calif. 93101.*

## SOFTWARE

DIGITAL MANAGEMENT  
GROUP, LTD.  
DMG/NET

Digital Management Group, Ltd. has announced that its DMG/NET networking software package is now available for Digital Equipment Corp.'s VAX-11/VMS running under DEC's RSTS/E operating system.

DMG/NET employs user-defined

mnemonics to create a connection between computers in a network by using a variety of communications paths, including direct links, leased lines, autodial to the phone system or X.25 packet assembler/disassemblers, according to the vendor. Connection to the DMG/NET takes between three and 20 seconds, on the average, the vendor said.

The package finds alternate destinations if the main path is busy and gives specific messages as to why a connection cannot be made, such as if the destination is busy. A password protection function ensures that a user cannot connect to a place to which he is not authorized to connect.

The basic, single-CPU license for direct network connections is \$2,000. Options include autodial support (\$500) and X.25 support (\$1,500). Discounts apply for secondary licenses.

*Digital Management Group, 4800 Yonge St., Willowdale, Ontario, Canada M2N 6 G5.*

## AT&amp;T from page 63

ated the need to hire staff to perform similar evaluations.

If consulting services were, indeed, provided by Information Systems, an obvious question would be: Can the user be assured that the company has his best interests in mind vis-a-vis its relationship to AT&T Communications?

The second likely result of permitting Information Systems to resell long-haul services will

be the company's entrance into the shared tenant service business.

Multitenant service providers, as they are sometimes called, typically install cabling and switching facilities in a building and lease the capacity to its inhabitants. They also usually provide for the sharing of long-distance services. Tenants, therefore, can anticipate savings in equipment — they do not have to install or maintain any of their own — and services.

The development of this market, which has

taken off in the last couple of years, represents one of the few remaining bright spots for large system PBX vendors.

The market has contributed greatly to the rapid growth of Dallas-based PBX manufacturer Intecom, Inc., of which AT&T Information Systems must be keenly aware.

Announcements regarding either or both of these scenarios could be made by the end of the year, gauging by the date of the FCC decision and the unwillingness of the firm to discuss its plans.

**B**efore you applaud IBM's song and dance for the 3725 Communications Controller, talk with Centron DPL about your 3705.

*Your 3705 is a tough act to follow.*

Chances are good that your 3705 will fill your needs at considerable savings for some time to come. Centron DPL has the hardware, technical services, and financial expertise to coax an encore from your 3705.

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We support our leases with an extensive inventory of features and upgrades, our own technical services division, and a complete refurb center.

Discuss your 3705 with one of our representatives today. We'll show you that it may be too early to let the curtain fall.

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## IN DEPTH



PHOTO © 1984 BY ED BRAVERMAN

# The office away from the office

By Gil E. Gordon

---

***Telecommuting is not as widespread as some reports suggest. But more than 200 employers do run programs. DP may be asked to set up telecommuting for others in the company or its own workers. Prime candidates for working at home are systems engineers, data entry clerks, documentation writers, training specialists and systems programmers.***

---

For years we have improved virtually every aspect of work except getting to it. The tremendous advances in information processing have changed what we do but not where we do it. Employers and employees continue to pay the price in lost time, lost productivity and expense for the often difficult trip to the office.

There's a promising alternative being explored by more than 200 employers — telecommuting. Simply stated, telecommuting involves the use of alternate work locations, such as homes of employees. For some, this idea evokes an image of banging away at a terminal while lounging in a bathrobe — perhaps a nice alternative to the rituals of dress and commuting many people are accustomed to. Most managers are at least familiar with the term telecommuting, but few are aware of the many forms it takes, the benefits it offers and the implications for information processing management.

This short quiz checks your understanding of telecommuting. Answer each question true or false.

1. Telecommuting is limited to data processing jobs such as programming or data entry.
2. Telecommuting is primarily for women at home taking care of young children.
3. Telecommuting means working at home.
4. Telecommuting means being away from the



## IN DEPTH/TELECOMMUTING

office five days a week.

Most people would say all of these statements are true. That's not surprising given the image telecommuting has developed. In fact, all four statements are false — the myths of telecommuting.

People have been working at home for years, and not only as craftsmen or self-employed small business owners. And there has always been some segment of the corporate work force that never was office-based — sales representatives, delivery people, meter readers and so on. But the idea of taking people who were traditionally office-based and moving them to the home is fairly new. It began as the result of two seemingly unrelated developments: gasoline shortages and wider use of remote terminals.

#### Started with survey

During the Arab oil embargo, a research team led by Jack Nilles at the University of Southern California studied the uses of imported oil, especially gasoline consumption. The survey determined that roughly 5% of U.S. oil use was for commuting, and that if commuting could be cut by 20%, the country could save 190,000 barrels of oil a day.

Nilles proposed what was at the time a somewhat radical idea — *The Telecommunications-Transportation Tradeoff*, which, in fact, was the title of the final report of the team. The idea was simple: Instead of bringing all the people to the work, why not bring some of the work to the people electronically? The concept was well-conceived and the report well-written, including some case studies about possible applications in the Los Angeles area.

But despite a strong argument and the memories of sitting in gas station lines fresh in everyone's mind, not much attention was paid to the Nilles study by government or industry. This indifference was probably caused by the state of development in remote processing.

In the mid-1970s the use of terminals and even distributed processing was widespread. But there was no such thing as a personal computer, so perhaps for many managers the idea of work away from the central office was not understood. Nilles, incidentally, coined the term "telecommuting" as a convenient way to describe the substitution of telecommunications for transportation.

#### Early programs

The other main event in telecommuting's history involved some early experimental work done by Control Data Corp. and Continental Bank of Illinois. CDC began to use its Plato computer-

based instruction system to teach homebound disabled people to become programmers and eventually to work from home. Continental Bank began a pilot program with several women at home transcribing dictation tapes onto word processing systems.

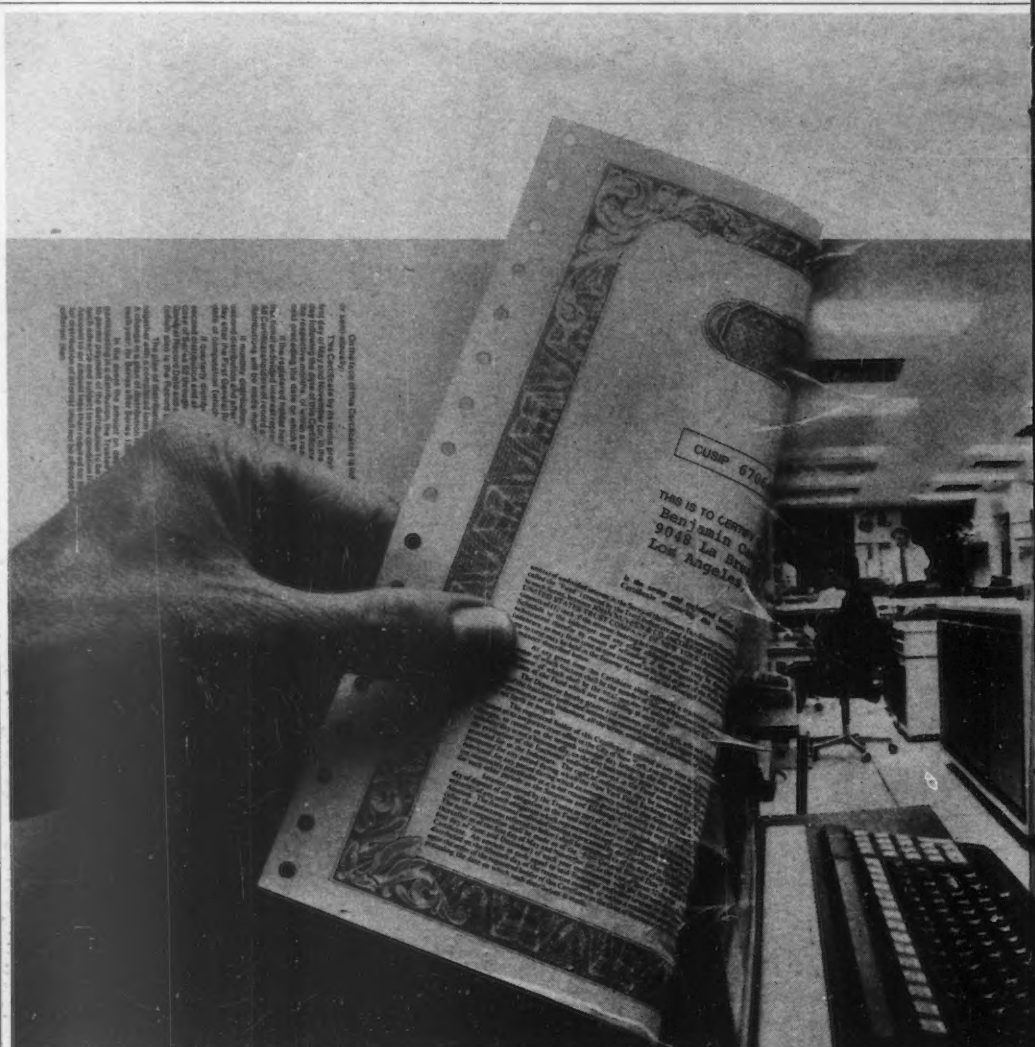
Though both programs were small-scale, they were important because they began to demonstrate the feasibility of remote work, even though there were some

rough spots in getting the programs under way.

CDC markets a product called Homework aimed at retraining people on long-term disability leave to be programmers at home. The company also instituted a remote-work program for a limited number of employees.

Not until 1981 did the idea of working at home come to the attention of large numbers of people. Alvin Toffler's book *The Third*

*Where does telecommuting stand today? It's well beyond the kind of curious novelty it was in the late '70s but not at all as widespread or accepted as some reports might suggest. There are more than 200 employers with some kind of program under way, ranging from one or two people up to almost 100.*



### NUVEEN'S MAGIC BONDING AGENT

John Nuveen & Company needed something to hold it all together. Again.

The nation's largest investment banking firm specializing in municipal bonds and tax-exempt bond funds was being disrupted by dramatic changes in its business.

Traditionally, a limited number of banks and investment firms had comprised Nuveen's customer base, but starting in 1978 more and more individuals began investing in the bonds and Unit Investment Trusts handled by Nuveen. By early 1982, volume had doubled for the third time in five years and operations were overwhelmed by Nuveen's growth period.

"It was time, once again, for increased capabilities," com-

ments John Claiborne III, Vice President and Manager of Information Services at Nuveen. "Basic Four equipment had come through for us twice before, so we went to them again. What we needed this time was a powerful super-mini that could crunch numbers at remarkable speed, that could handle all types of interactions during the day and batch action at night, and join together all of our terminals and national branch office network.

"It seems that whenever we had a need, MAI had an answer. This time it was their newly developed 8000 series."

Claiborne volunteered to "beta" test the new super-mini in Chicago and within six months, "We had mastered

## IN DEPTH/TELECOMMUTING

*Companies with strong customer service commitments can use telecommuting to extend the hours of operation for inbound order-taking or customer inquiry numbers. Similarly, they can use employees at home to help handle peak-call volumes without tying up office space.*

Wave was published that year, and a chapter titled "The Electronic Cottage" described in detail the concept and its prospects.

There is some question about the feasibility or even desirability of some of the scenarios described by Toffler and other futurists, but there's no doubt that the kinds of changes they predict are starting to happen already.

Where does telecommuting stand today? It's well be-

yond the kind of curious novelty it was in the late '70s but not at all as widespread or accepted as some reports might suggest. There are more than 200 employers with some kind of program under way, ranging from one or two people up to almost 100.

These numbers exclude probably an equal number that are "underground" programs. Some firms don't discuss their programs, and others operate almost illicitly,

away from the scrutiny of line management or the personnel department.

#### Avoiding potshots

There's an important message here about telecommuting: The managers who run these operations clandestinely do so because they derive real benefits but don't want to take on the bureaucracy that will take potshots at this kind of innovation. This is more a result of misunderstanding the concept than anything else.

What are the benefits of telecommuting? Here are four:

- Improved recruiting as a result of being able to hire people who otherwise could not or would not work the standard five-day week in the office. This group includes people with family responsibilities at home, those with short-term or long-term medical problems or those who simply prefer a more flexible work schedule.

- It is this last group that accounts for a good deal of today's telecommuters; these people prefer the flexibility and often are in fields where demand exceeds supply. Their employers use telecommuting as another recruiting method, not unlike liberal fringe benefits or state-of-the-art systems.

- Improved retention of people who are trained and trusted employees but who might otherwise have to resign if they could not work at home. This group might include those with medical or family care needs, but also can involve the spouse in a dual-career couple whose partner is relocated.

- Some firms are exploring telecommuting as an alternative to corporate transfers; when possible, they consider moving the new job to the employee in his current location, rather than the reverse. Not only might the employee be retained (if the alternative was resignation instead of relocation), but the employer avoids a cost of \$30,000 or more for the relocation.

- Reduced office space costs because of having fewer people at any one location.



the learning curve and optimized the system to fit our needs. It worked like a charm.

Today, Nuveen & Company's farflung and complex activities are tied together by two earlier Basic Four® systems plus two new MAI® 8030s. This high-capability equipment brings multiple advantages to the multiple tasks required by Nuveen:

- Fully configured with three processors, the MAI 8030 can support a large number of users. For Nuveen, the current hookup is 130 terminals with 100 of them on the two 8030s and the remainder on the earlier machines.
- The built-in system arbitrator balances Nuveen's demanding work load among the three processors to enhance the system's productivity.
- The system is hardware independent allowing Nuveen to upgrade hardware or operating system software as tech-

nology advances.

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## IN DEPTH/TELECOMMUTING

It now can cost \$4,000 to \$6,000 per year just for office space in many midtown locations to house one professional-level employee. Firms that are growing quickly, need interim space until a new building is ready or simply need to cut overhead costs can benefit from telecommuting.

■ Improved productivity resulting from fewer distractions and the ability to work on one's own best schedule, within limits. Gains of 20% to 40% are not unusual for telecommuters. They tend to get more work done per hour, work more hours and, in the case of time-sharing-type operations, get more processing cycles per session because they are often working at times other than the fully loaded first-shift hours.

There are other benefits that vary according to each organization's needs. For example, companies with strong customer service commitments can use telecommuting to extend the hours of operation for inbound order-taking or customer inquiry numbers. Similarly, they can use employees at home to help handle peak-call volumes without tying up office space.

Companies can "weatherproof" their incoming phone lines by having telecommuters available to handle calls at home when they might be unable to get to work at the central office. J.C. Penney is a good example of a firm that uses telecommuting for some of its catalog-order telephone centers.

#### Human resource issues

The implications of these programs for managers are far-reaching. Careful planning and implementation is required, with a special emphasis on human resource management issues. Examples include: selecting the right people to work under these arrangements; identifying the right jobs or clusters of jobs that can be done off-site; training the manager to manage subordinates from a distance; and training the off-site employees to cope with working at home.

These last points are critical, since an important success factor is the manager's ability to supervise (and trust) the remote workers. Alternate work site programs are not primarily a technical challenge; they are a managerial challenge and proper attention must be paid to managerial concerns.

Let's consider a typical manager. He frequently sees his subordinates in the office and can ask and answer questions about their work. When those people are off-site most of the time, the manager's methods may have to change. First, he must better define job expectations, including the nature of the work to be done, time limits, quality concerns and so on. While good managers do this for all employees, many managers substitute close contact and close supervision for good managerial practices. This isn't a criticism of the manager; it's easier to rely on the luxury of frequent contact.

Another challenge is to refine the skill of giving performance feedback. The person at home (or elsewhere off-site) has the same need for feedback and direction as the person in the office. The manager must take extra steps to measure progress and give direction. This communication often can be done on the phone or via electronic mail.

There are many other implications

*As much as possible the employer should help the remote worker feel a part of the social and information network of the office. This contact can range from routing reports and publications to less business-oriented (but still important) functions such as luncheons or cocktails after work.*

for both manager and subordinate under alternate work site programs. For example, there is the need to profile the remote worker's need for contacts and information from the office. As much as possible the employer should help the remote worker feel a part of the social and information network of the office. This contact can range from routing reports and publications and being in-

vited to staff and project meetings to less business-oriented (but still important) functions such as luncheons or cocktails after work. With remote work, there should be the expectation of continued contact in all forms, rather than the expectation of separation.

One of the other major tasks involved in telecommuting programs is the selection of people who can be

productive away from the office. Several companies that tried these programs early on relied on self-selection, generally with poor results. Office workers may opt to work at home based on a short-term view of the benefits — less commuting, cheaper meals and so on. They often underestimate the impact of relative isolation and the need to be one's own manager.

#### Screening candidates

The employer must carefully select employees using information from the manager about the person's work habits and planning skills. Potential telecommuters can also be screened using one or more appropriate personality inventories that help indicate the person's need for social interaction and ability to direct his own activity.

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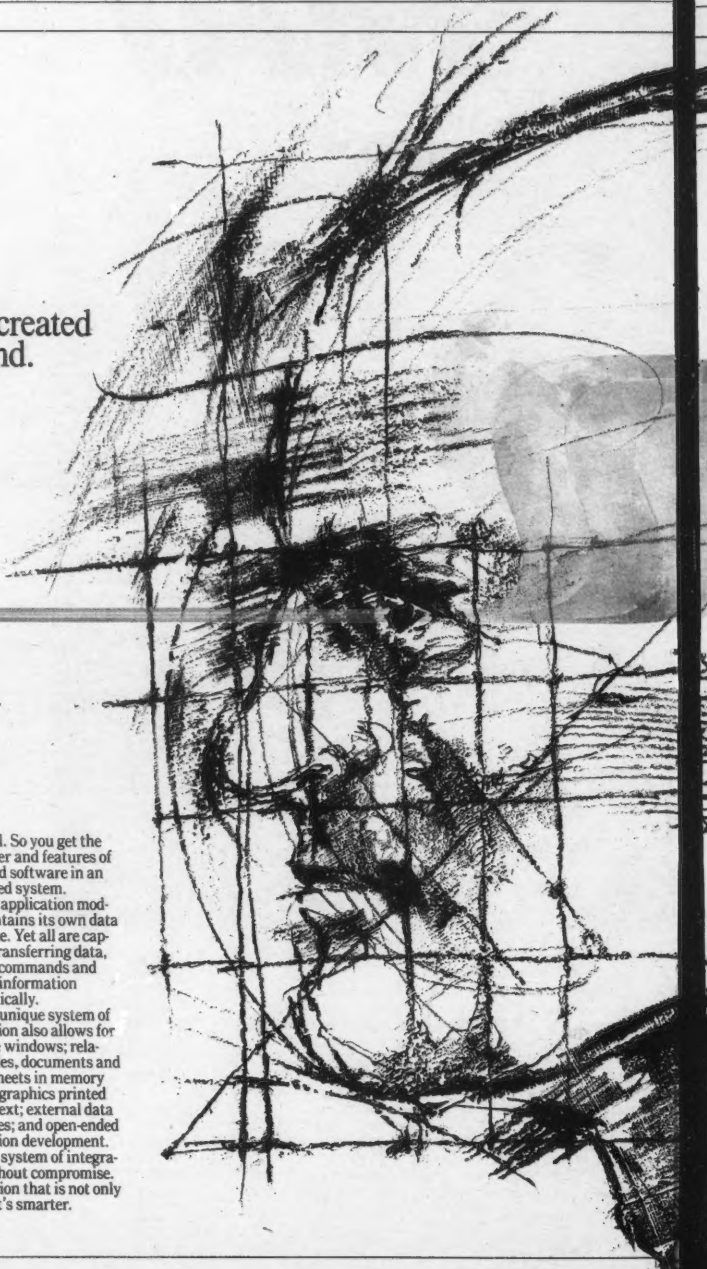
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# IN DEPTH/TELECOMMUTING



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Telecommuters may work at home, in a satellite office or neighborhood center.

Alternate work sites can take a variety of forms. One person may work at home with a terminal or computer, or a group of employees may work in a small satellite office with or without the electronic link to the main office.

Another form is the so-called neighborhood work center; employees who live in the same area go to their neighborhood office to work; they avoid the time and cost of commuting to the main (downtown) office.

## No equipment

Finally, telecommuting can apply to a person working at home with no equipment — a documentation writer, for example. Telecommuting doesn't imply the use of a keyboard, although it's safe to assume that some type of personal computer or

terminal will be present in many remote jobs.

Here are some of the possible applications for telecommuting and how the DP department might be involved as a user or a partner with other departments using remote workers.

Within data processing, potential applications go far beyond programming. The data entry area is a prime candidate because of the nature of the work (well-defined, measurable tasks).

Systems engineers or systems programmers are also good prospects. Interestingly, this group often gets started in remote work "accidentally." Someone who is on call during the evening hours starts to do remote diagnosis via terminal instead of driving to the office in the middle of the night. It's only a short jump from there to part-time work at home. The person figures that if he can do it at 3 o'clock in the morning, he can do it at 3 o'clock in the afternoon.

## Writers, trainers

Technical or documentation writers and DP training specialists are two other job categories in DP that are candidates for telecommuting. In most cases, the technical writer's job is perfect for telecommuting: well-defined tasks and a predictable yet minimal need for face-to-face contact.

The work of training specialists may or may not fit. The best use would be in the design and development of training materials. Actual delivery of training at a remote site may not be feasible unless the trainer wants to invite a dozen people to his living room.

The important things to remember when considering these and other applications are:

- Analyze the task and find out if it fits the profile of a remote job — for example, well-defined and measurable tasks plus a minimum of unplanned or crisis-type interactions with co-workers or users.
- Don't be limited by the way a job is done today or by the way it appears to be done. A job that may seem a poor prospect for telecommuting may look that way only because of how it's done, given the luxury of frequent, close contact in the office.

An interesting experiment is to keep a log for a week of all contacts a potential telecommuter has with co-workers or users, including the form (memo, phone, in-person, meetings, electronic mail). Review the log with a critical eye and ask how many of the in-person contacts were really necessary. Could some of them have been handled by phone or electronic mail? For those that must be done face-to-face, determine how many could have been scheduled as opposed to being impromptu drop-in sessions.

In most cases, the presumed need for frequent face-to-face contact and access is really not justified — at least for the kinds of job categories we are considering here.

With the right mix of phone use, electronic or voice mail and periodic visits to the office, business can go on as usual. A sensible approach to telecommuting includes provisions for one half-day to two days a week in the office in most cases, on a schedule that makes sense for the telecommuter and the in-office co-workers.

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## IN DEPTH/TELECOMMUTING

*As more white-collar workers begin to use and rely on personal computers or terminals, more jobs will become "portable" for at least a portion of the week. It is becoming clear that workers in almost every field use, manage and manipulate information.*

Finally, there is one more broad consideration about possible telecommuting applications in the DP department.

Some DP managers may feel that the trend toward end-user computing and the growth of information centers are two examples of DP's changing role.

They expect that the trend figuratively (and even literally) brings the function up out of the basement. With more user contact comes less

of the solitary nature of many DP tasks and, so goes the argument, less opportunity for telecommuting.

**Not an end**

Without disputing the trend, there is a good reason why it probably should not hamper efforts to implement telecommuting.

End-user computing will not, at least in the foreseeable future, mean an end to the need for the traditional large-system applications

like general ledger, billing and payroll.

Those systems may be more accessible, and users might download and analyze excerpts of them, but the DP department will still be charged with developing and maintaining them.

Many of the jobs that support these applications are good prospects for telecommuting.

**Data entry**

Applications outside of DP can encompass many of the same kinds of functions as within DP, especially in light of end-user computing and the trend toward having users do some or most of their own data entry. Other applications can include a financial analyst at home with a microcomputer and an electronic spreadsheet program or a market research analyst who prepares reports using information from an on-line data base of market information.

The range of applications now includes economists, telemarketing representatives, customer service staff, personnel representatives and marketing managers, among others.

As more white-collar workers begin to use and rely on personal computers or terminals, more jobs will become "portable" for at least a portion of the week. It is becoming clear that workers in almost every discipline use, manage and manipulate information.

With close to 60% of the U.S. work force classified as information workers, it's no surprise that many of them can and will work away from the office at least part of the week.

Telecommuting can also be used for those aspects of a person's or department's work that do not require much interaction in the office.

The earlier example of the DP trainer is a case where telecommuting might be used in cycles. The trainer is off-site when developing programs but in the office when conducting them.

Many staff jobs across the organization are of this cyclical nature; the challenge is to rely on the flexibility of telecommuting to shape a program around specific problems or organization structures.

**DP role**

Where does the DP department fit in when other corporate units decide to embark on telecommuting? If the project is done correctly, it will probably be led by three groups: the user (the department with the telecommuters), the personnel department and the DP group.

All three have a stake in the successful use of telecommuting. The data

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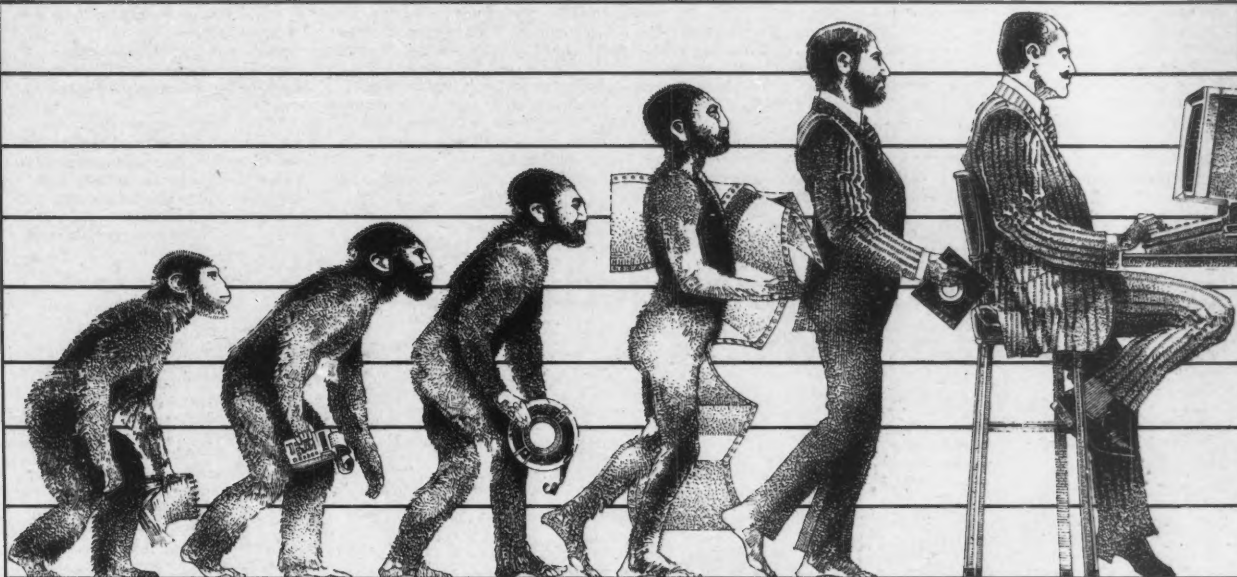
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## IN DEPTH/TELECOMMUTING

processing representation here refers to several functions that may or may not report directly to DP management. These include telecommunications, systems engineering, equipment selection, applications programming, DP security and DP training.

While telecommuting is in most cases not a technical challenge, the technical staff must be involved from the outset. There will be questions of equipment selection and compatibility, communications and/or applications software and telecommunications planning.

All the questions facing DP management in the office today also face telecommuting, including dial-up access, security provisions and maintenance of remote equipment.

These issues have to be addressed early in the planning stage to avoid

*Where does the DP department fit in when other corporate units decide to embark on telecommuting? If the project is done correctly, it will probably be led by three groups: the user (the department with the telecommuters), the personnel department and the DP group.*

eleventh-hour crises.

The questions of security and liability often are raised as obstacles to telecommuting. Companies that are considering implementing remote work programs need to consider these points:

■ What is the incremental security risk with telecommunications compared with security concerns in

the office environment?

I found it ironic (and a bit alarming) that in one firm considering telecommuting there was great worry about dial-up access risks — yet I noticed two terminals on desks in an open "bull pen" office area with passwords posted on notes taped to the terminals.

The security problem is serious,

but it's not always correct to assume that work at home is an automatic open door to security breaches. The same combination of software, hardware and good management solutions useful in DP security in general must be applied to telecommuting. This also includes an assessment of risk vs. benefit; if an application can't be made secure enough to satisfy your auditors (or even the manager) then it doesn't make sense to take the chance.

■ Questions of equipment theft or damage and possible work-related accidents in the home may come up. Here again, some common sense planning often can prevent problems.

The use of a "telecommuter's agreement" is suggested to spell out the rights and responsibilities of employer and telecommuter to lessen the chance of problems. Advice from the company's legal, insurance or risk management departments is often in order.

### Accepting innovation

Few, if any, innovations are adopted smoothly and quickly in large (or even small) organizations. Someone once noted the similarity between large companies and super-tankers that need three miles of open water to execute a turn.

As much as chief executives say that they want their people to take risks and be responsive to changing conditions, many organizations are still very much like the sluggish supertanker.

Telecommuting, at least at first glance, seems to many to be a somewhat radical approach that is at odds with everything held sacred by most managers and employers. "How can you manage someone you can't see?" they ask.

And how do you convince managers weaned on the notion that more is better (more staff, more office space) that having some of their staff away from the office doesn't take anything away from their status?

The answer to these and similar questions or objections has to be found in the business solutions telecommuting offers. When approached as nothing more than a possible solution to a certain set of business problems, telecommuting loses some of its mystique and becomes less of a threat.

Just as firms have begun to realize that not everyone must work the same 40-hour week (hence the growth of options like flextime, part-time work and job-sharing), they are increasingly realizing that not everyone must work in the same place. Telecommuting is an idea whose time has come as an alternative to — not a replacement for — office work as we know it.

### About the author

Gil E. Gordon is founder and president of Gil Gordon Associates, a consulting firm located in Monmouth Junction, N.J. The company specializes in human resource management and the implementation of telecommuting. His prior experience includes almost 10 years of personnel management at Johnson & Johnson Corp.

Gordon spoke on telecommuting at the National Computer Conference. He is currently writing a book on telecommuting for Prentice-Hall, Inc.

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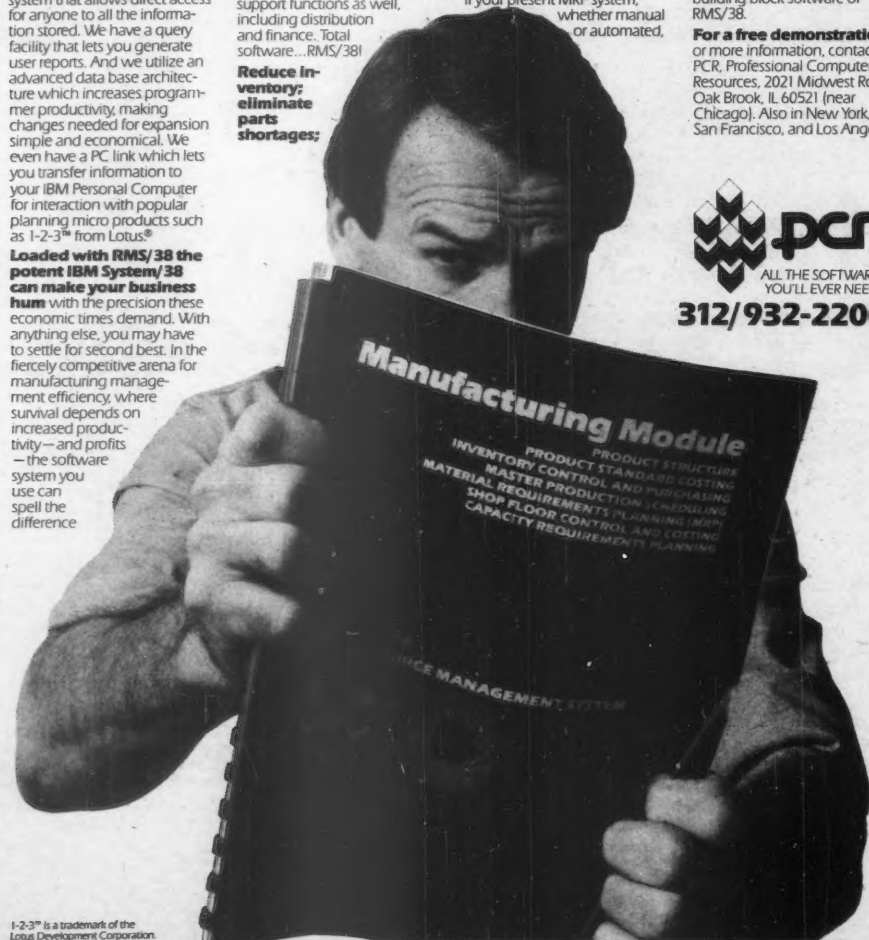
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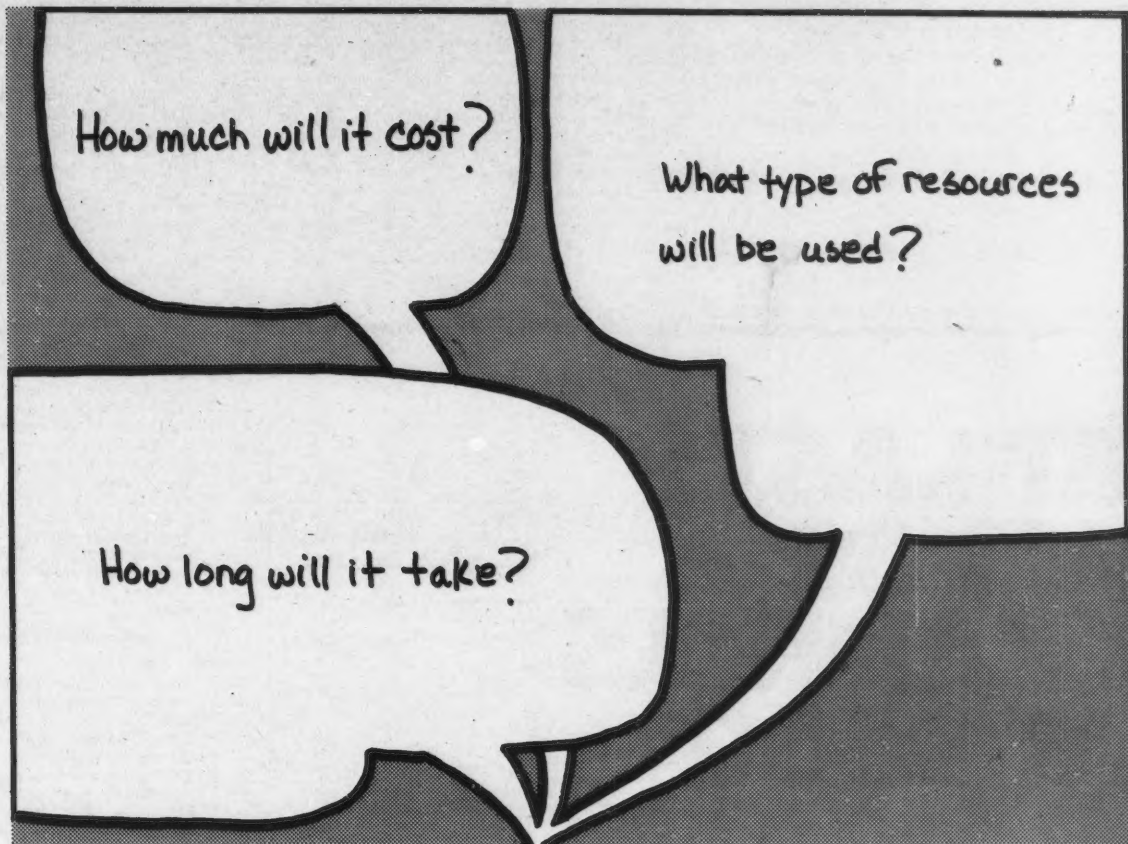
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## IN DEPTH



# Try talking before automating

By Robert J. Walsh

Total project management and control begins before initiating or implementing any automated design tool. It begins when the user communicates his request to do something to the project developer. Communication continues throughout the life cycle of the project.

Open any trade newspaper, magazine or periodical and you will find some new gadget on the market that will "automatically" revolutionize the data processing world. There are top-down and bottom-up analytical tools, project management and control systems, total systems design methodologies, programming and testing aids and a variety and combination of just about anything that could be thought of to take a product from inception to sign-off. Everything, that is, except the required intelligence to ensure that what the user has asked for is indeed what that person will be getting.

One can't deny that the advent of automated design tools is a definite plus to the analysis, design, programming and testing of a product or system. Nor can one deny that the market is being flooded by a new, advanced or revolutionary tool every time a project manager turns around to scratch his head. Unfortunately, systems will not develop by themselves... regardless of how many automated tools are placed at

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***Before a project can begin, before one item can be plugged into an automated design tool product, before one line of program code can be generated, project ground rules must be established. Thus begins communication with the end user.***

---

## IN DEPTH/TRY TALKING

*Starting in the wrong direction from the beginning will not provide the user with a viable system; instead, it will cost the corporation an excess of resources and leave the user with a system that is not exactly what he was looking for.*

the disposal of the data processing manager and his subordinates.

Determining user needs is probably the most important and overlooked factor of any project's cyclical development process. Analyzing an existing system and designing a new system to fit those requirements is more than plugging facts and figures into a program and expecting a totally acceptable system to appear magically on a screen or to print out of a

terminal somewhere.

A project begins when someone (the user), somewhere wants something done in a restrictive time frame (usually yesterday). The user either has a system that needs modification or replacement or has requested a new system based on changing requirements in that person's department.

A user has needs and wants. The user may want a Concorde to take him from point A to point B, when a

bicycle will suffice. It is the project developer's responsibility to sort out the needs requirements from the wants and provide the user with a system that will satisfy his needs, regardless of his wants.

Determining those needs is the prime responsibility of the project developer. Starting on a path in the wrong direction from the beginning will not provide the user with a viable system; instead, it will cost the corporation an excess of resources and leave the user with a system that is not exactly what he was looking for.

An automated tool is only as good as the data it is receiving. It still requires the initial up-front work to define and redefine the scope, objectives and direction of the project; it still requires the developer to understand thoroughly the current user system under study; and it still requires communication between the product developer, the user, management and line and staff personnel to ensure product viability, accuracy and cost-effectiveness.

#### Communication gaps

Many projects fail, not because of a project developer's lack of knowledge or ability, but because of communication gaps within and outside of the department. The user assumes the developer understands the problem; the developer assumes the user understands where the project is coming from.

Under these adverse circumstances, both are unpleasantly surprised when it comes time to implement, and they realize that neither one was talking the same language and no one took the time to find out why.

Before a project can begin, before one item can be plugged into an automated design tool product, before one line of program code can be generated, project ground rules must be established at the time the project is initiated and not after it is up and running.

Using automated tools to massage data, to create "what-if" situations, to perform extensive modeling tasks and to do prototyping is indeed a valuable resource for the project developer. Feeding the proper data into the system is a procedure that many developers take for granted. For any system to succeed, a proven design methodology or path must be installed to guide the product through its cyclical development process.

#### Two categories

Design methodologies generally fall into two basic categories: the traditional top-down analysis and the more state-of-the-art bottom-up (structured) analysis. Each methodology requires some

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## IN DEPTH/TRY TALKING

sort of a path to follow to take the project from inception through its post-implementation (installation) evaluation. This path is sometimes referred to as a systems development methodology, product development methodology or variation thereof.

A systems development methodology consists of a number of checkpoints called phases. A phase provides a grouping of logical tasks that must be considered before the project moves into its next phase of development.

The number of phases will vary from corporation to corporation, but most use a systems development methodology that consists of five to 10 phases, with one or more sub-phases depending on the size of the project. Smaller projects may combine phases for efficiency.

The tasks associated with each

phase allow the project to follow a logical progression through its developmental cycle. The by-product of each phase is a series of reports that provide the user, management and DP personnel with information to review where the project has been, where it is now and where it is going. Once the project progresses to a point where the initial up-front work has been performed, the automated design tools become invaluable. Progressing to that point of confidence, however, is where the problem lies with many corporate-developed systems.

#### Begins with request

Effective project management begins when the user-initiated project request crosses the developer's desk. The request to do something may be verbal, a "one-liner" or a massive

document prepared by a staff of users. In all cases, the project should not move any further until the developer can put the initial request in his own words, defining its scope, objectives and expected direction.

The initial request must be scrutinized to determine what the user is actually saying. Restraints, constraints and mandates must be identified, including what is to be done and what is not to be done during the course of the project. Any and all assumptions should be put to rest, or at least justified, before information is plugged into an automated design tool program.

Once the project developer is confident that he and the user are speaking the same language, the number of required phases, major tasks, initial time frames and resources can be identified. Again, the

importance of this initial work must be stressed. Beginning a project on assumptions will only cause more work as the project moves along. There could be changes in direction, lack of information (that should have been identified earlier in the project) and an overall uneasiness between the user and project developer.

### *Effective project management begins when the user-initiated project request crosses the developer's desk.*

Getting from that initial starting point or project initiation document to a point of effective use of the automated design tools at your disposal can be a complex and tedious task. The following guide will help the project developer to identify successfully the parts of the system before progressing to a point of no return.

The guidelines represent the work required by the project manager or assigned product developer prior to entering a structured systems development methodology path. The estimates determined at this point are initial guesses, but they should reflect an approximation within reason. Depending on the magnitude of the project, the overall responsibilities listed below should be completed in a minimum of time, usually less than three to five days.

In most instances, management or the user has already defined time and/or cost restraints. This initial evaluation will either confirm or not allow these estimates by presenting a list of logical detailed facts and figures to the requester. The time and cost factors provided at this early stage of the project are raw estimates, subject to considerable change as the project progresses through its subsequent phases of development.

**1. Become familiar with the project's scope, direction and objectives.**

**A. Analyze the initial project request form.**

1. Define the scope, objectives and goals.
2. Identify overall project parameters.
3. Determine project viability.
4. Identify constraints, restraints and mandates.
5. Define (restrictive) time factors.
6. Identify and define risk factors.
7. Identify project contacts (permanent and temporary): User, management and tangent operations (accounting, marketing and so on).
8. Define cost requirements/restraints.
9. Define project direction (immediate, short-range, long-range).
10. Develop a priority list, including global, secondary and possibilities for a second (later) project.

**B. Communicate the project's initial direction with the user.**

1. Separate the need from the want.
2. Put all parameters into perspective.
3. Clarify terminology.

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## IN DEPTH/TRY TALKING

4. Clarify project timing requirements.

5. Redefine initial (user) direction to current (redefined) direction, cost/time restraints and constraints, major (mandated) requirements and major (required) checkpoints.

**C. Identify the magnitude of the project.**

1. Determine the number of phases to be used.

2. Justify the number of phases to be used.

3. Identify each major checkpoint and its requirements.

4. Identify authority and responsibility levels.

5. Communicate your evaluation with staff members.

**D. Identify the major tasks within each phase.**

1. Define each major task's parameters.

2. Define subtasks (if identifiable at this early stage).

3. Communicate your evaluation to staff members.

**E. Identify tentative team member requirements.**

1. Specify the talent level required.

2. Define additional training requirements.

3. Define tentative staff members: who, dates (or phases) required, projected work load.

**F. Identify other resources.**

1. Hardware: what will be required, when will it be needed, time frames, possible vendors, overall ramifications for the present system.

2. Software: initial considerations, special considerations, responsibility factors, time requirements (installation considerations). If vendor-developed, determine possible (or suggested) vendors, pros and cons of each vendor or product. If in-house developed, determine if it is yet to be developed, existing to be revised and its interfacing requirements.

3. Peripherals: type of peripherals, known ramifications, possible

*But systems will not develop by themselves. Systems development, in any environment, requires the knowledge of an experienced developer and up-front work.*

problem areas (interfacing, installation).

4. Additional office space.

5. Additional and/or temporary staff.

6. Miscellaneous equipment.

**G. Communicate the facts again with: the user, DP staff and team members, quality assurance (if part of corporate requirements), management.**

**II. Outline an applicable method**

**for project control.**

**A. Identify automated design tools to be used.**

1. Analytical.

2. Design.

3. Programming.

4. Testing/evaluation.

5. Project management.

6. System development methodology.

**B. Develop an initial time factor charting technique.**

1. Gantt.

2. Gasp.

3. Network.

4. Variance analysis.

5. Pert.

6. Combination, hybrid or other.

7. Based on automated design tool requirements.

**C. Develop a methodology for applying costs to the structure.**

1. Plug-in factors.

2. Based on corporate requirements.

**III. Outline an applicable work breakdown structured methodology.**

**A. Formulate a system to determine tasks within phase.**

1. Identify: major tasks, subtasks, programmer/analysts assigned to tasks, critical path tasks.

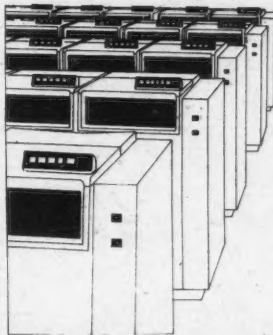
2. Control: time factors, cost

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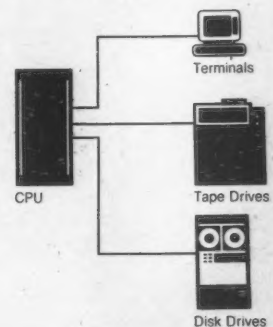
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## IN DEPTH/TRY TALKING

*Once the project developer is confident that he and the user are speaking the same language, the number of required phases, major tasks, initial time frames and resources can be identified and work can begin.*

factors, resources (people/hardware) assigned.

3. Determine reporting mechanism: phase end, project's progress (between phase end), identify problem areas.

B. Develop a method for charting the tasks.

1. By major task.
2. By subtask.
3. By resource.
4. By critical task.

C. Develop a method for reporting phase/project progress.

1. Tasks on schedule.
2. Tasks behind schedule.
3. Critical path tasks.
4. Resources used to date.

IV. Develop a project/task matrix.

A. List all major tasks within phase.

1. Identify related subtasks.
2. Identify resources assigned.
3. Identify critical path discrepancies.
4. Specify initial time factors.

B. Establish a charting method to predict the project's progress.

1. Automated.
2. Manual.
3. Hybrid.

V. Develop time estimates for the project.

A. Project a tentative completion date for each task by:

1. Projecting (initial estimate) time for subtasks.
2. Accumulating time for major tasks (within phase).

B. Based on your calculations, project a tentative completion date:

1. For each phase.
2. For the project.

C. Show your reasoning behind the projections based on:

1. Resource availability.
2. Vendor software availability.
3. Hardware availability.
4. Current project direction.
5. User agreed-upon major and subtasks.

VI. Develop manpower/resource estimates.

A. Develop manpower/resource estimates based on:

1. Projected number of phases.
2. Projected number of major (known) tasks.
3. Projected number of (known) subtasks.

4. Talent level of resources to be assigned to the project.

5. Tentative starting date.

6. Current user agreed-upon needs (and unresolved wants).

B. Document your estimates by:

1. A reliable charting method (manual or automated).
2. An agreed-upon scenario by the DP staff, user and management.
3. Training and education schedules.

C. Communicate your initial estimates with:

1. DP staff and team members.
2. User.
3. Quality assurance.
4. Management (as required).

VII. Develop an overall (tentative) project schedule.

A. Revise your (reviewed) estimates based on:

1. Resource availability.
2. New or revised user requirements and/or mandates.
3. New or revised user constraints and/or restraints.

B. Firm up any loose ends.

1. Commit user and management to project specifics.
2. Get a commitment on required resources.

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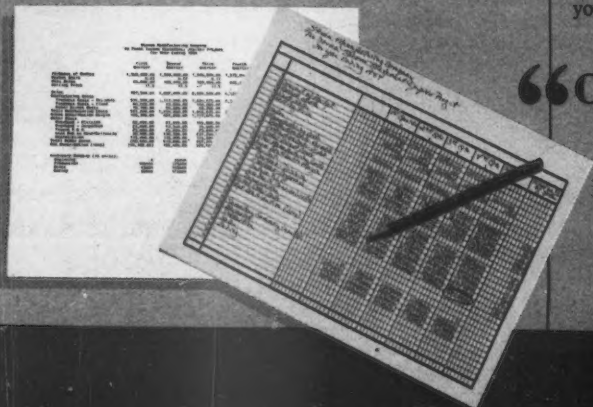
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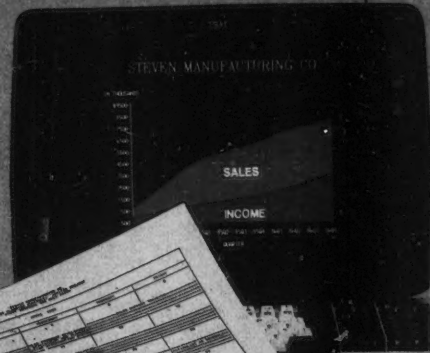
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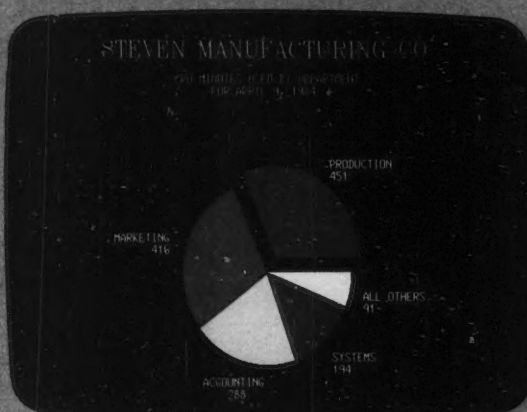


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## IN DEPTH/TRY TALKING

*In a multiproject, multiuser environment, no price is too high for a system that will accurately control and report on the project's progress and associated resources.*

3. Recalculate (as required) the time/resource projection charts.
- VIII. Apply a cost factor to the project schedule.
  - A. Apply the cost factor based on:
    1. Hourly resource charges.
    2. Projected vendor software.
    3. Projected hardware requirements.
    4. Lag time.
    5. Staff training, education, vacation and sickness

- projections.
6. Decisions (pending).
- B. Justify the costs based on:
  1. Overall project projections.
  2. Each phase's projections.
  3. Major (and identified) tasks.
  4. Tentative hardware/software commitments.
- IX. Schedule the mandatory project control documents.
  - A. Establish a project

- control workbook (documentation manual).
  - B. Establish a maintainable project change (request) log.
  - C. Establish an acceptable resource/cost charting method.
  - D. Develop a maintainable task matrix schedule for each phase.
  - E. Develop a requirements list for each phase-end report.
  - F. Schedule periodic project status reports.
  - G. Develop an action plan for the first development phase.
  - H. Establish the criteria for intraphase reviews.
- Developing any system, whether from scratch or by purchasing a vendor-developed package, is hard work. Automated tools make life easier for the project developer, providing they are used correctly. The same errors will surface in the automated system as would appear in the manually developed system if the project developer is inexperienced or fails to do the proper footwork at the beginning of the project.

Another factor in implementing an automated design tool at any corporation is the cost of the tool. Project development tools range from less than \$1,000 to more than \$100,000, depending on the frills a corporation wants to hang on the system. The cost of the tool does not include training, learning curves after training or the cost of maintaining the data that is spewed from the automated system. In a multiproject, multiuser environment, no price is too high for a system that will accurately control and report on the project's progress and associated resources.

Used wisely, automated design tools can efficiently and effectively aid in the design and control of a developing system. But systems will not develop themselves by themselves. Systems development, in any environment, requires the knowledge of an experienced developer.

It requires a certain amount of up-front work to ensure that the project is moving in the right direction. And it requires a judicious control of the resources required and assigned to the project.

#### About the author

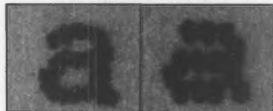
Robert J. Walsh has been active in the data processing field since 1964. His experience ranges from programmer to DP manager. He is currently a senior product quality and advanced technology analyst at Avco Corp. in Wilmington, Mass. This article is adapted from *A Modern Approach to Project Management*, scheduled for publication by Prentice-Hall, Inc. in January.

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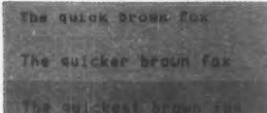
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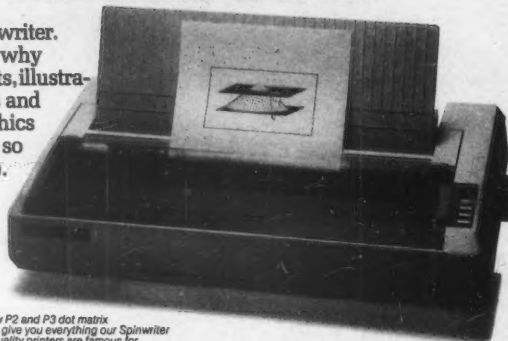
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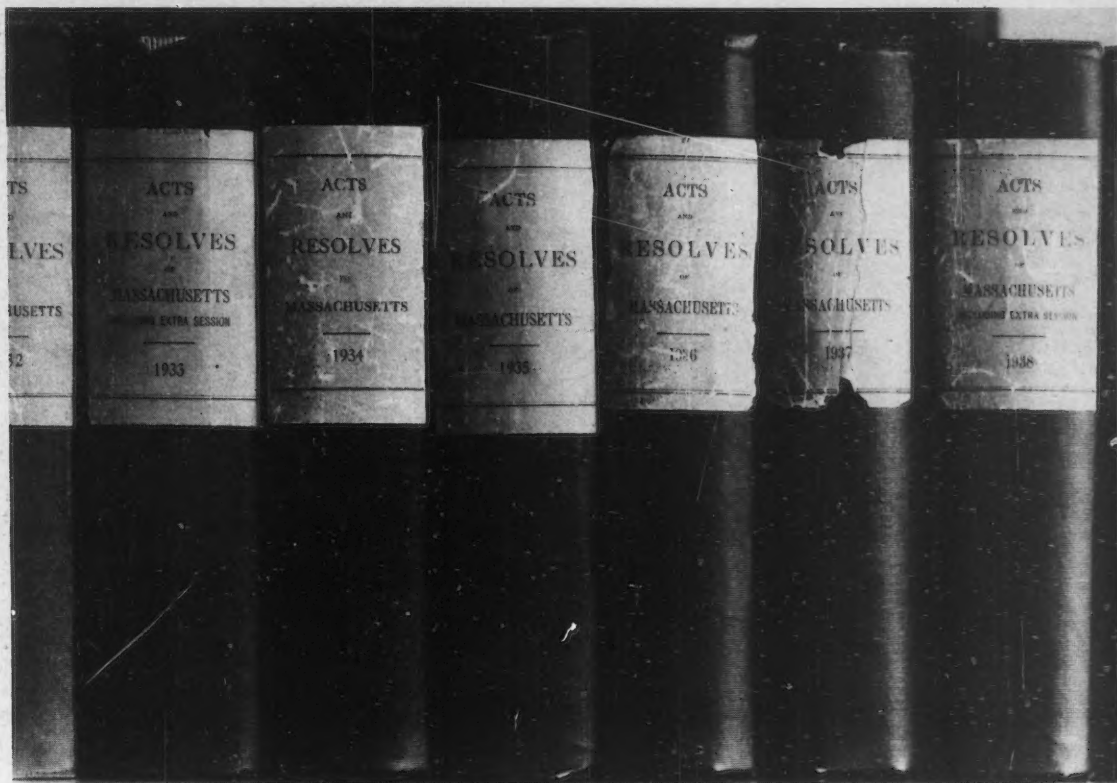


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# Who should pay for a program error?

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***Suppose a programmer's mistake causes medical equipment to fail or an on-board computer causes a car to crash. A simple typographical error can cost a business hours or days to regenerate data. In such cases, how will the courts decide liability?***

---

**By Norman L. Wilson Jr.**

There are no assurances a program will not fail. One expert estimates that as many as 40% of all computer systems fail at one time or another.

We know that programs can be tested for long periods, without signs of a flaw, and later reveal one. A minor mistake, such as a typographical error, can cause the loss of data requiring hours, and sometimes days, to regenerate. Even malfunctions beyond the control of programmers, such as cosmic radiation, can bring about failures. Suppose a programmer's error causes medical equipment to fail, resulting in death, or an automobile computer contains an undiscovered error. How are our courts to decide these cases?

The report of the settlement of the Apple Computer, Inc. suit stressed that the question of copyrightability of read-only-memory-based programs remains unsolved. Numerous articles have pointed out the inadequate legal protection afforded computer software. Because of barriers along the patent route, courts are having to blaze a copyright trail. But even that path is tenuous.

The law, like theology, is lagging behind the sciences. Traditional legal concepts are foreign to issues raised by computers. Computers have posed problems for which the law is not ready. Akin to the so-called information gap, it is not quite possible to fit computer problems into



## IN DEPTH/WHO SHOULD PAY?

traditional areas of the law, leaving the law in a snarl we must untangle.

Those close to computers realize that errors appear in obscure ways. Yet there is no doubt that the programmers and corporations marketing them are responsible for some degree of care. The dilemma is deciding the degree of care to which the supplier should be held. Should the supplier satisfy a reasonable degree of care or should it owe the greater degree of care, that due from an expert with special knowledge?

## Decision by analogy

Considering the diverse ways programs can fail, it is almost impossible to define this degree of care. There are no industry standards. There are no previous decisions for guidance. And there is increasing likelihood that lawsuits will be brought as programs fail. As a result, courts are faced with the prospect of deciding liability for faulty computer programs, not by precedents, but by analogy. It may be helpful to examine the legal principles to which they will refer.

At the moment we are not certain what law will control computer program liability. The variety of legal theories available in the normal liability arena provide attorneys with a host of potentially confusing approaches.

One approach may well be an action instituted under the Uniform Commercial Code (UCC) for the sale of a faulty computer program. The UCC, adopted by virtually every state except Louisiana, is concerned

*There is increasing likelihood that lawsuits will be brought as programs fail. As a result, courts are faced with the prospect of deciding liability for faulty computer programs not by precedents, but by analogy.*

with the sale of defective products. Its rationale is contract law. Its purpose is to protect innocent purchasers. The first question raised by the UCC will be, "Is a computer program a product?"

## Intangible items

There is a tendency to view a product as an article of personal property. Intangible items are not usually considered to be articles. Computer programs are intangible. They are electronic impulses. This means that lawyers will argue that the sale of computer programs is a service and not a sale of a product. The medium, such as a tape, a punched card or a disk is only tangible evidence of the program and not the program itself.

Since the UCC is concerned with defective products and not services, courts must decide whether computer programs fall within the UCC. A review of recent decisions reveals a tendency to define "product" more broadly. Perhaps the better view, then, is that computer programs are products.

If the UCC is deemed applicable,

the parties will be arguing contract law, either written or implied from the purchase. The approach at this point will probably be to raise the question of warranties, that is, guarantees. Did the seller expressly guarantee that the program would perform in a certain way? Is the language of the warranty an instruction or a limitation? What is the warranty period? In the case of an express warranty, special care must be taken by the seller to make the buyer aware of the conditions of his guarantee. The buyer, in effect, is relying upon the seller's affirmations.

In light of the unpredictability of computer programs, the practice in that industry is to refrain from making affirmations, that is, to disclaim rather than to warrant. A disclaimer is a tool for limiting liability. The program is sold on an "as is" basis with no guarantees. This, however, is not a foolproof solution. Lurking in the shadows are implied warranties, perhaps the source of most of the litigation in the warranty arena. In making a purchase, one naturally assumes the product is fit for the

purpose for which it is sold. And courts want to protect that assumption. The result is an implied warranty of fitness. To counter this, products are sold with an allegation that "The parties agree that the exclusive remedy against the seller shall be replacement and that this remedy is in lieu of any express or implied warranty."

## State of confusion

It can be appreciated that the state of warranty law is one of confusion. Imagine how an uncertain product such as a computer program will compound that confusion. Moreover, inherent in warranties are certain time, injury and damages constraints.

None of us expects an ad infinitum guarantee when we purchase a product. In addition, failure to abide by warranties is a breach of contract. The rules, remedies and rewards in contract law are, perhaps, more limited than in negligence law. So if damage is extensive or if personal injury results, parties, as we do now, will look to negligence law.

"A new baby was being born and I was very concerned with the success of that baby and how healthy it was going to be." These are the words of the president of an insurance company, referring to a new computer system he had ordered. The system was to include hardware, programming aids and software, designed to handle the company's vast record keeping and billing requirements. To the supplier's embarrassment, especially since it was replacing a working

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## IN DEPTH/WHO SHOULD PAY?

system, the new system produced printouts in which all of the figures were wrong.

Their personnel arduously attempted to correct the deficiencies in their programs, even making modifications along the way. But their attempts were unsuccessful. The essence of the lawsuit that followed was that due to negligence in preparation and design of the computer system it completely failed. The failure led to the ultimate commercial demise of the insurance company.

This trial would have alleviated some of our negligence concerns. Unfortunately, they were not considered by the court. New York law provided that negligence claims be brought within three years of the act. This suit was brought too late.

Let's go back to the degree of care that is owed a consumer. It is agreed that this duty of care is greater than that of a reasonable layman. But how much greater the duty of care should be is a matter of controversy. Judges might classify computer programs as inherently dangerous, requiring the highest degree of care, because of their use in automobiles, planes, power plants and other perilous surroundings. Others will argue that the program becomes dangerous only when improperly used.

Some writers on the subject believe programmers should be held to a professional degree of care. The driver of an automobile, for instance, blamed General Motors engineers for negligence in its design of a steering assembly. An architect who prepared plans and specifications for a library building was sued for its defective roof.

As cases involving doctors, lawyers, engineers and accountants report, acts of malpractice may not be readily apparent to the client. Accordingly, a professional degree of care is due the buyer. Those adopting this view of computer law emphasize that programmers represent themselves as professionals with special expertise. As professionals they would be held to a level of care exercised by a member of the profession acting under similar circumstances.

One judge, in a pretrial ruling, found a programmer, as in the case of other professionals, guilty of malpractice. If programmers are considered professionals, the law that will apply is that those undertaking any work requiring special skills are required to exercise not only reasonable care in what they do, but a duty beyond that because of their special knowledge and abilities. In effect, they will be compared with their peers.

#### Fair standard?

The higher degree of responsibility standard presents several unresolved difficulties. Given the odds of program failures, is it a fair standard? Further, since there are no professional organizations as in the case of doctors, lawyers and engineers, there are no industry standards by which a computer company can be judged.

There is also a difference in the end use of the product. A doctor or architect is in an environment. Software may be used in a complex aircraft or a business with which the programmer is not entirely familiar. His program may be only a portion of the overall project.

The degree of debugging required

of an expert is also without definition. If a program was tested for a long period and it is argued that a flaw would have shown up with a few more hours of testing, did the company fail in its degree of care? I think we can agree the duty software companies owe to their purchasers is nebulous indeed. We have, however, examined the premises involved. It might be said that at the moment, these areas are too sophisticated for the law.

Once a duty or standard of care is established, we must still determine whether the software supplier violated that duty. Assume for example that the program went into new automobiles. In the alleged negligently designed steering assembly, the suit was brought despite the fact that other factors were involved that may have caused the accident. The

*One judge, in a pretrial ruling, found a programmer, as in the case of other professionals, guilty of malpractice. If programmers are considered professionals, the law that will apply is that those undertaking any work requiring special skills are required to exercise not only reasonable care but a duty beyond that, because of their special knowledge and abilities.*

court held that the manufacturer of an automobile is under no duty to make a car accident-proof. Certain risks are assumed in driving an automobile.

Can the consumer assume this risk if he doesn't know a computer is in

the car? Will it be possible to separate driving errors from computer program errors?

Whether the software merchant violated his duty of care is complicated by the fact that the programmer may not have had sufficient



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## IN DEPTH/WHO SHOULD PAY?

knowledge of the use of his program.

Assume someone else was hurt by the automobile. We now have the programmer's duty to a third person. Long ago it became the law that accountants owe no liability for negligence to creditors and investors who relied upon their certifications. Programmers should come under that umbrella. But in this litigious society where we are showered with lawsuits this question may have to be settled in the courts.

#### Lack of standards

Looking back, the special knowledge and ability a programmer or his employer must exhibit is a matter of argument. As we have pointed out, there are no professional or industry standards by which he can be judged. If, in addition, there is no way to guarantee that a particular program will not fail, this complex negligence problem might better be approached along the lines of "no fault" accidents.

If it is difficult, if not impossible, to guarantee that a program will not fail — that is, if the software is too sophisticated for the manner of failure to be understood — it will be argued that the producing company or programmer should be liable even though he exercised all possible care. This is the doctrine of strict liability. The reasoning behind it is that since the person responsible for the product can best reduce the hazards, he should do so. The supplier of the product, because of his knowledge of the product, is in a better position to anticipate and control the

risk of injury.

The buying public may have neither adequate knowledge nor sufficient opportunity to determine whether or not the purchased article is potentially defective. Under such circumstances, one who sells a product that has a great chance of failing is liable for the harm done even though he may have exercised all

*If a program was tested for a long period and it is argued that a flaw would have shown up with a few more hours of testing, did the company fail in its degree of care?*

possible care. As long ago as 1960 the New Jersey Supreme Court held that the wife of the purchaser of a defective automobile was entitled to recover damages from the dealer and manufacturer for personal injury although there was no showing of negligence.

It remains to distill from this uncertain mixture of computer software liability solutions a solution that is the most expedient. The solution that we shall condense will be labeled "risk assumption." The advantages of using a potentially de-

fective program may outweigh the disadvantages of doing without it. But the demand for the program may serve to distribute the risk.

To illustrate risk-spreading, let's consider how software is marketed. If a family needs new drapes, they can purchase them in one of three ways. The drapery company can go to the home, determine the requirements and tailor the drapes to fit the windows. The family can call on the drapery company, pick out ready-made drapes and give the dimensions for modifications to the drapery company. Or the family can also purchase off-the-shelf drapes for its windows. Obviously computer programs can be bought the same way.

In the first instance the purchaser provided a great deal of the input and, possibly, was as knowledgeable as the seller. Transposing this to software, the program was generated to meet specific requirements. It is probably of no use to anyone else.

Because of this limited application, in a suit for a faulty program the buyer should assume part of the risk. Perhaps indemnity should be apportioned, as it is under California law, according to the extent that each party's fault contributed to the failure. At least gross, rather than ordinary negligence, should be the standard for judging the seller's degree of care.

In the second instance, where the software is modified, it may be necessary to determine whether the bug or malfunction was in the original portion or the modification, the negligence test being less stringent. The

original portion might even come under the off-the-shelf approach to be discussed. If an error appears in the modification, the contribution each party made to the modification may have to be examined.

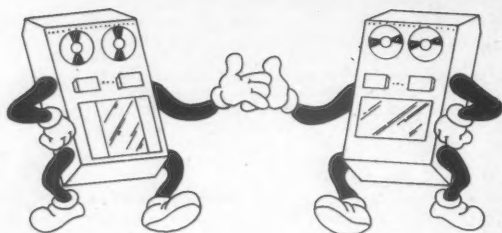
In the case of off-the-shelf software, distributed to a large number of users, public policy dictates that the supplier be responsible for its hazards. In other words, the producer should be strictly liable. The user of mass-produced programs may know very little about them, relying on the supplier's expertise. The supplier is in the best position to anticipate and control the risks. Because of the wide distribution of the programs the supplier is able to spread the risk among all of the users through the extensive source of income. The resulting income should provide for insurance and liability claims.

Trust and confidence should exist in data processing as in other professions. The parties should examine together the possibilities of program failure, to anticipate failure effects and to attempt to provide for them. Should this not be possible, the user will determine who is potentially liable for the loss and on what theory he should proceed. The programmer, on the other hand, would be wise to advise the user of both the possibility and the impact of any errors.

#### About the author

Norman L. Wilson Jr. is a patent attorney in St. Louis. He works on government software agreements and computer patents.

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## IN DEPTH



# Getting the most from consultants

***Got a problem? Call a consultant. Before he gets there, lay the groundwork for a productive relationship. Members of the Independent Computer Consultants Association tell you how to get the most out of them for the least money. They spoke to senior editor George Harrar.***

**John Springfield**  
Newton, Mass.

Sometimes people know exactly what they want. They may need some IBM CICS applications developed or in-house training in CICS. Other times, they need a whole system specced.

If an application is reasonably well specced and the consultant knows the operating system and language, then he can give a fairly decent estimate of the cost. If the client is vague, then he has the problem of dealing with the vagueness of my price. If I'm doing training, I usually charge \$75 an hour. Straight application development runs \$40 to \$45 an hour.

I work mostly in large universities, such as Northeastern University, Boston College, Cor-

nell University and the University of Hartford. I've also done subcontracting for large companies.

Most of the time the data processing manager calls me in, but sometimes it's the vice-president of finance. If you don't have the blessing of the DP department, that's a hurdle you have to overcome. Maybe I shouldn't call it a hurdle — it's groundwork you have to lay.

Usually the situation is that the DP manager is overworked. I go to him and explain that I'm there to augment his staff or do something he doesn't have time to do. I tell him that I have expertise that no one on his staff has. If it looks like a situation that he can handle, then I just bow out. It doesn't help anyone if I stay in that kind of situation; it's too much of a hassle.

In most cases, the DP manager has been consulted before I'm brought in. He is the one who controls the resources. It could be that the higher-up simply doesn't understand that what he wants isn't feasible. What's needed is a second opinion, and I might agree with the DP manager. The question then is can we do it another way, a scaled-down way, given the budget and machine restraints under which he's operating?

I have allegiance to the people who sign the contract. On the other hand, I don't go in to antagonize people. If a senior vice-president



## IN DEPTH/CONSULTANTS

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calls me in and says, "Take a look at this situation," he is the one I report to. On the other hand, I usually get along well with the DP department because I come from that background and know the kind of strain the manager is under.

I've been in the field since 1973. I started at Liberty Mutual Insurance Co. in Boston, in large IBM Cobol applications. From there I went to Boston College, where I became assistant director of MIS.

From my point of view, I would like at least a chance to prove myself with a DP manager. If he's neutral, that's good enough for me. Hopefully, we can come to a good working understanding. Sometimes the water has been poisoned before I get there. Then I tell the person who wanted to hire me that it just isn't going to work.

It's important to have a systems programmer who I can talk to. If I'm developing an application, generally a systems programmer has to set up some Vsam file. I also need someone who can put new transaction IDs in CICS for me; maybe I need some disk space or test files. Unless they know my work has some priority, they may have other things they want to do first.

I might also need access to a librarian. I would need to talk with a librarian to move programs in and out of libraries to modify them. I'd also submit documentation to the librarian. It might also be that I would be working with some of the applications programmers, but that's usually not the case.

Most of the time I'm brought in because these people are overworked. Then I just need some time

periodically to talk to the DP manager to make sure that what we are doing is consistent with what else is going on there. Sometimes I get the impression that people think that you just bring in the consultant and that's it. But there need to be meetings, benchmarks, where people say, "This is good, let's continue."

A vice-president will call me in and describe a situation where they don't think they are getting enough out of the DP department and want to do some application that I'm familiar with. Then I'll talk to the DP department and find out it doesn't have the right computer to do that application. There's just no communication there. The vice-president doesn't understand what the computer can and cannot do; he's totally unrealistic about timing.

I go back and tell him that what he wants done cannot be done with the resources he has. Maybe I get those people talking to each other. It's a situation where the end user, who may be higher up in the management, is simply unrealistic about what can be done on a given machine or software.

**Ald Horton**  
Pepperell Software, Inc.  
Pepperell, Mass.

Much of the time we will be working in the user environment itself, acting as a liaison between the user and DP. In that situation, it is important to have high-level support.

If it's consulting to supplement current staff, you are filling a slot, so the level of person who calls you in doesn't matter. If you are called in to do major enhancements or new enhancements, then the higher the level, the less degree of difficulty there is.

Conflicts can occur when you suggest something that is a direct affront to what the DP manager has suggested. You try to come up with a mutual agreement, but sometimes he does have to be overruled by a higher-up. You try to avoid that situation. Sometimes we might be off in what we suggest because of something we don't know about. Then we change our opinion.

### Hard feelings

There was one situation a short time ago where the late work of various people on a standard production run on a nightly basis affected the whole plant. I was called up there to look at the existing system and speed it up so that output would be ready for people starting work in the morning. That situation caused hard feelings because the daytime DP staff was not able to effect the change.

Basically, to do it in a short time period, we violated virtually every shop standard. The rules are basically set up for the general level of expertise of the DP shop. The rules protect the people against themselves. The junior person may take two or three times to do something; the senior person or consultant may take one — or at least he can cover himself.

Setting up test data bases, writing a program against a test base — these are things we did not do. There were standard procedures about where we should put an executable program, for example. But for expedience, maybe we put the executable program in the data area.

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## IN DEPTH/CONSULTANTS

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**Never prepared**

The DP manager should be prepared for the consultant to arrive. He needs to have the scope of the project lined up, what he wants the consultant to do, what duties, restrictions and expectations he has. How often is that the case? Never.

There are always some things that are not addressed until the consultant asks a question. Or you run into a situation where a meeting is called at the last minute. Everyone runs off to the meeting, and the consultant drinks coffee for the first hour. Sometimes it's a simple thing where security hasn't been notified, or no ID number has been set up.

The DP manager should have a place set up for the consultant to work, a desk or perhaps a terminal. Often they say, "We'll have to look around for a place to put you." I had one experience where I showed up at 8 o'clock. Luckily I knew where the coffee machine was, because no one bothered to say hello until 11.

The DP manager's attitude can make or break the project. Unfortunately, the primary reason the DP manager brings you in is to supplement staff because he doesn't have the expertise or manpower to complete a project. With higher level consulting, the DP manager usually has been told to bring you in. He may be affronted. Usually you don't know which is the case, but you find out real quick.

**User needs**

Most systems are developed by the data processing department without really investigating what the user needs and how he functions. Systems get designed in a vacuum. A user may be down on the system because it doesn't supply his needs. Typically, a communication gap exists between user and DP — they don't speak the same language. I try to speak in English.

One of the best approaches is to try to get an MIS or DP manager to at least be receptive to an independent and unbiased evaluation of his operation. That can be difficult because the DP manager has a personal involvement.

It may simply be a case where he can't see the forest for the trees — he's too close to the problem. That's simple to work out. Another problem: The DP manager is go-

ing down the wrong track, and the consultant sees that because his breadth of exposure is greater.

**Larry Hendershot**  
President, Irma Corp.  
St. Louis

Usually the DP manager or someone above him contacts me. The higher up the person who calls you, the easier it goes.

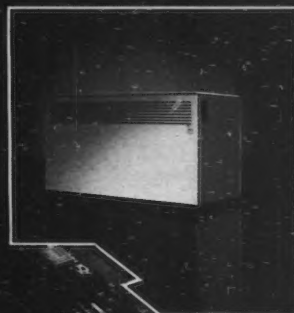
I've been in situations where the expectations of

the vice-president and DP are not the same. The executive does not have as broad an understanding as DP does. Five or 10 years ago, the vice-president was not that concerned with what happened within DP. It was a small organization; it had no real visibility.

As a result of the tremendous growth in DP, the vice-president of finance and all of executive management are becoming more aware of the impact of DP on the success

*What we are finding is that there is a starvation of information at the executive level on DP expectations, terminology, function. They need to know, and there aren't that many classes or seminars available to educate executive management.*

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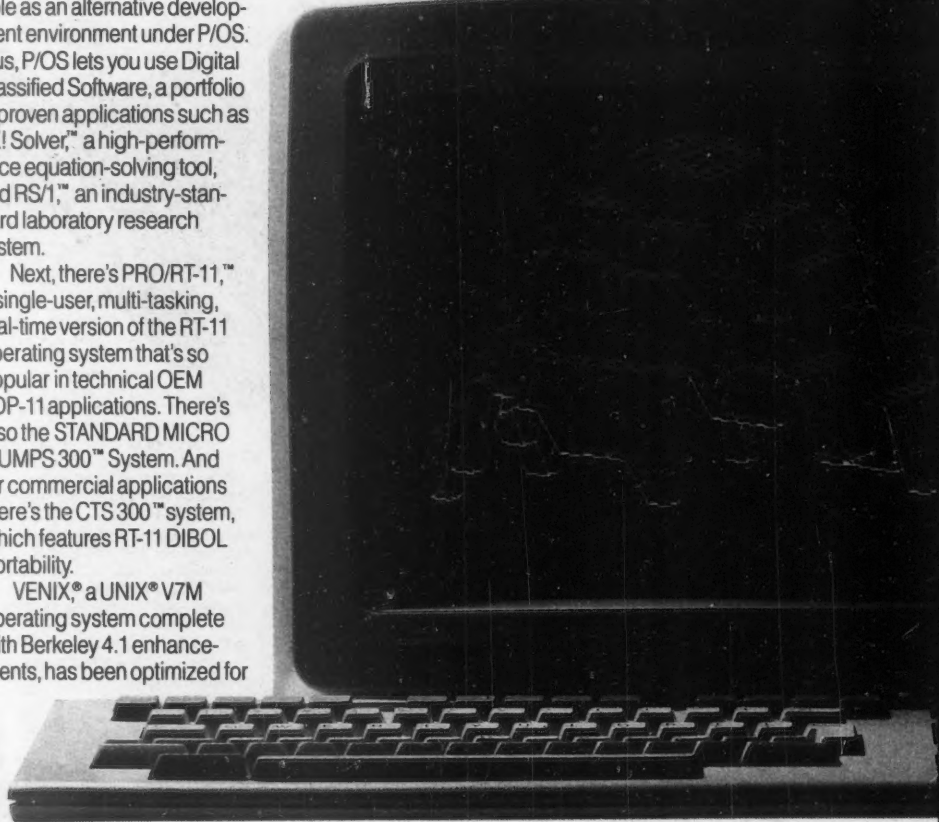
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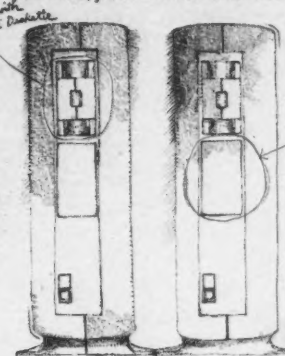
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## IN DEPTH/CONSULTANTS

*The consultant has to play interpreter. He is listening in French and speaking in German. There are times when the executive himself really cannot grasp what's going on in DP.*

of their total business. As a result, the vice-president of finance or the executive officer—to whom DP is reporting—they need to know more about DP and the true expectations.

The vice-presidents now recognize that they need to know about DP, but they are wrestling with understanding the complexities. Usually the director of DP has dealt with it for 20 years and has a pretty good understanding. The vice-presidents are try-

ing to comprehend in a very short time what DP people have taken 10 or 15 years to understand. That puts a burden on vice-presidents.

They are extremely busy with the day-to-day running of the business. It's hard for them to find time to get a true understanding of DP and what it can do for their business.

#### Qualified education

What we are finding is that there is a starvation of

information at the executive level on DP expectations, terminology, function. They need to know, and there aren't that many classes or seminars available to educate executive management. I must say "qualified education"—there is a need for somebody who can talk to executive management in a language they can understand and still get across the concepts of DP.

They don't want to hear about tape drives, storage memory and so on. They want to understand the function of DP as it relates to their portion of the business. Somebody who is used to teaching bits and bytes really cannot properly conduct an education class for management.

The consultant has to play interpreter. He is listening in French and speaking in German. There are times when the executive himself really cannot grasp what's going on.

I've had the other situation also, where the DP manager isn't qualified. That's unfortunate. When one or the other isn't qualified, you have to simplify [very much] the functions of DP to get the points across. Even once it's understood [by the vice-president], it's still hard for him to comprehend why it can't be done the day after tomorrow.

#### Third-party credibility

I've had a number of situations where the executive tends not to believe what his DP manager tells him. A third party can tell him virtually the same thing word for word, and he will listen. He thinks his internal people have a vested interest. The executive feels that an unbiased, outside consultant will be just that.

The DP manager should have a meeting with the consultant before the consultant comes in. Let's say the consultant will be there for a couple of weeks and starts Monday. He should meet with the director of DP for an hour or two during the previous week.

In that meeting, they should clarify objectives and discuss what the consultant requires to start work, such as scheduling meetings with key people, having raw materials available if the consultant is doing programming, work space, terminal and so forth. That should be available Monday morning at 8 a.m.

In my practice, I insist on the preliminary meeting. I put together a set of deliverables, a document... "This is what your report will look like, this is what we're going to do." If the director of DP does not call, I arrange for it. I indicate to him the people I want to talk to by function and ask his secretary to schedule these interviews.

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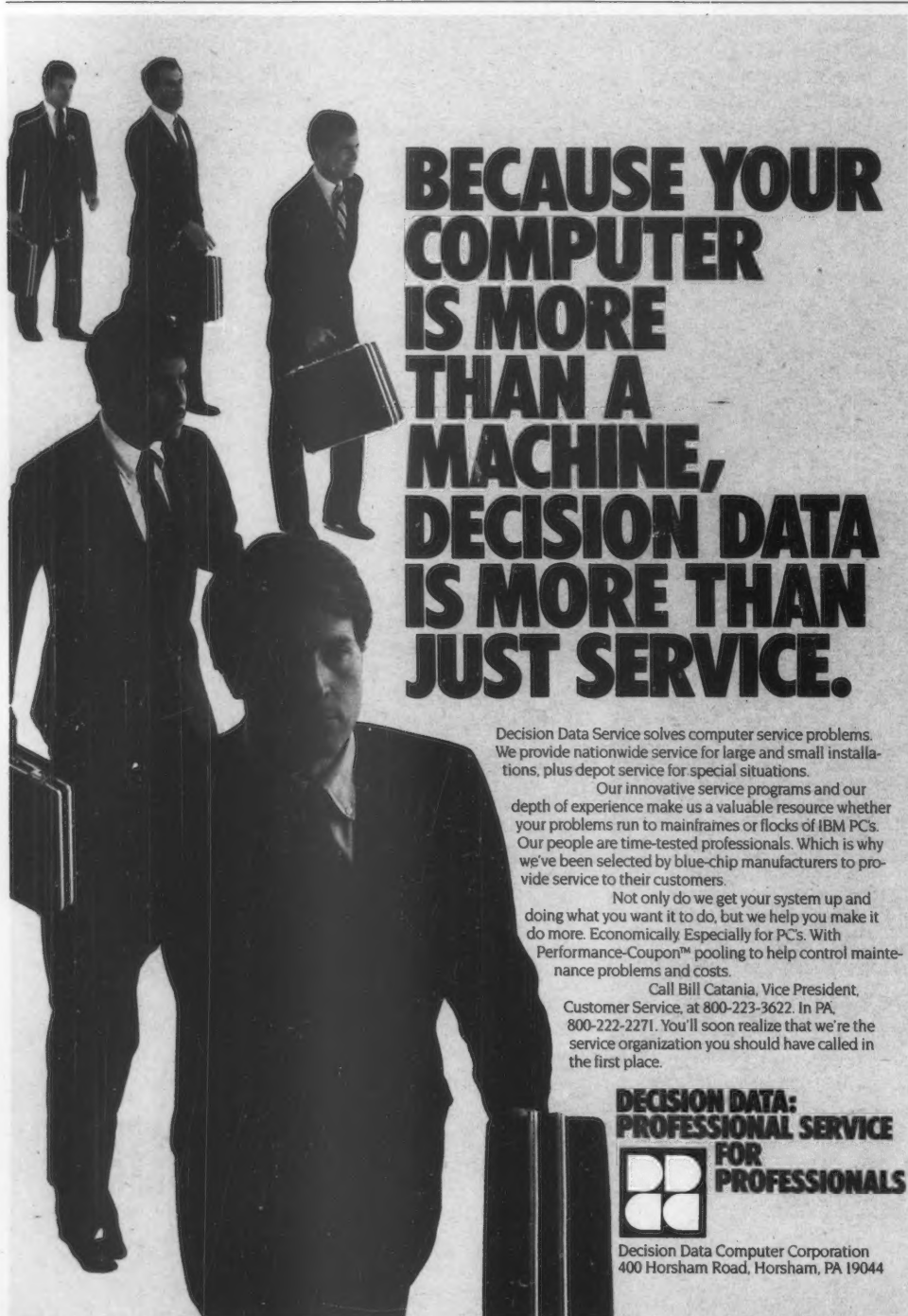
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## IN DEPTH/CONSULTANTS

I work on a daily and flat fee. For management consulting, the charge runs from \$650 to \$850 a day.

The DP shop is usually experiencing many small problems or symptoms. The user community may be dissatisfied, and executive management is not totally satisfied. And there is not one thing they can put their finger on that is the problem.

What I do is look at the total DP complex and evaluate the systems management processes necessary to move DP from a reactive mode to an act mode. We educate the current staff and implement effective systems management processes such as change management, capacity planning, performance management, project management, service-level agreements and so on.

A good consultant is going to put himself out of work; he wants to educate people and get them on their way to solving their own problems. A good consultant is a self-starter, he wants everything ready to go.

#### Ask for references

In choosing a consultant, the DP manager should ask for references. Call the references and ask one question: Do you know anyone else who has used this account? That way you find a client who may not be on the consultant's list of references.

Depending on the length of the contract, the DP director may want to meet with the consultant once or twice a week. You need a checkpoint to determine what you have accomplished each week.

The DP manager has to manage a consultant just like he does his own people. I've never experienced a bad situation because I've never let it develop. I lay out everything that is to be done. Some people talk about bad debts, bills not paid. In four years I've never experienced a bill not paid.

I have gotten into situations that were an absolute disaster, where companies felt like they were going down for the third time. That's the kind of job I like. The more screwed up it is, the better I like it.

I am not a programmer — I am a management consultant. How can a medium- or large-size company get its arms around DP? I find the most important thing is to educate executive management on true expectations of data processing. A lot of what you run into is, "I thought it was this way, but it really is that way." The DP manager is so darn busy that he doesn't have time to educate people; and second, the executive may feel that the DP manager is trying to sell him something.

**Bob Pretti**  
On-Line Solutions, Inc.  
Minneapolis

My primary emphasis is on systems analysis design, programming and development. A lot of times the development may be too large for the organization to develop itself, so I'll come in to help. They might buy a package, and maybe they haven't worked with it and don't know the intricacies and how it will affect other systems they are running right now or are planning to get in the future.

For instance, if they are converting to OS/MVS from DOS, it's a new ball game. Maybe at that time they don't have the in-house knowledge to do it.

*I've had a number of situations where the executive tends not to believe what his DP manager tells him. A third party can tell him virtually the same thing word for word, and he will listen. He thinks his internal people have a vested interest.*

For a particular type of business problem, a specifications document will enhance the possibility of getting a project done in a timely manner. A consultant should have it defined in writing, with as much detail as possible. Sometimes nothing has been defined; it's a verbal exchange of ideas — "Here's what the problem is, and here's how we think we want to solve it." Doing it that way can

cost them.

A department organizational chart is helpful to show who's who in technical support and elsewhere. You should be provided with the systems documentation, which should include record layout, program specs, some data flow diagrams and the job control language. If there is an interface to the system, where another system is feeding data to the

system with the problem, that has to be looked at also.

Depending on what the problem is, it might be better off having someone else come in to define the problem, someone who is not blurred by tunnel vision. There might be a person in-house who has worked with applications for years and years; they know that application backward and forward. But ask him to work with another application. He might know the interface but not the other things that affect the application.

My hourly rate averages \$35, depending on what we're doing.

One time I was called in to a retail food company that was closing a remote facility and bringing this application in-house to the central computer site. Many key people in the remote facility left the company. All

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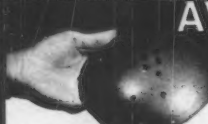
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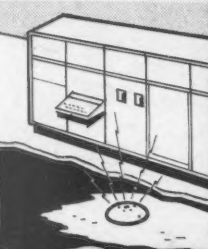
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## IN DEPTH/CONSULTANTS

of a sudden you had a situation where they had the application, and no one was really familiar with it anymore. The remote facility had been in another part of the country, they had their own computer there and no one bothered them.

When the company brought the remote facility under the corporate umbrella, they found that the application was outdated, not documented, patched and all the changes were in the heads of the people who had been working there. I got involved and really had to dig in and figure out not only what the system was doing but also how to generate user documentation and data flow diagrams.

You learn to become a diplomat; you have to play both ends. You owe it to management to get as much information as you can from individ-

uals. On the other hand, you have to reinforce to individuals that it was not your decision to do this. People will understand when truth is put to them: Give them a justifiable answer why things are done.

It boils down to the style of the particular DP manager. Some are better organized than others. Some delegate responsibility [for overseeing a consultant] to a project leader. The more the manager can explain to his

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people and get  
them on their way  
to solving their  
own problems.*

staff and to users why you are there, the more effective you can be. If they aren't aware that you're coming, the normal reaction is, "I don't know if I should be telling him this."

Sometimes the end user will tell you more than he would tell someone on the DP staff. Maybe they've already told someone on the staff about 20 times already. Oftentimes if it's something you can deliver to them, they're ecstatic.

It's the old communication game. What they tell you might not even be the problem, but if you sit down and rap with them, the real problem might come out, and it might be more or less serious than expected.

I don't believe the end user is consulted enough about the use and development of the system. I don't think his uses and needs are considered enough in the design of the system. A prime example is the explosion of the micro within an organization — that happened because the end users couldn't get the information they needed, so they decided to get it themselves. Nine out of 10 times the information is stored on the mainframe, but it's not available to end users.

### Intuition helps

When you're in this particular business for a time, you start to read people. Oftentimes you could do a few informal interviews and determine that this is the real problem, or here is another problem and it may lead to still another problem.

I've gone into companies where they have everything laid out beautifully in a folder with names of people, extension numbers, titles — that's made my job easier. An organizational chart and a company telephone directory are helpful.

Other times it's just verbal between the DP manager and the consultant. Then you have to find out who the end user is and what department he's in. I prefer the one where the situation is all laid out. It saves me and the company time.

Some DP managers do not like you to contact end users. Communication between the DP manager and the consultant is important. If the relationship is installed correctly, the consultant is feeding back exactly what he's doing and what he's found. The more each person is informed about what the other is doing, the better the project will go.



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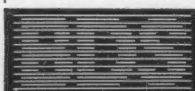
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# SYSTEMS & PERIPHERALS

## 'Mighty Mouse' beefs up HP's supermini line

System supports up to 28 users, can be networked via IBM's SNA

By Jeffery Beeber  
CW West Coast Bureau

CUPERTINO, Calif. — Hewlett-Packard Co. recently replaced the entry-level member of its HP 3000 series superminicomputers with a scaled-down model costing half the price and offering roughly the same performance as IBM's System/36.

HP's 3000 Series 37, internally code named "Mighty Mouse," reportedly incorporates two 16-bit parallel data paths and accommodates the firm's 55M-byte 7945A disk system, which also joined the company's product line last week.

Rated at .25 million instructions per second (Mips), the Series 37 is intended mainly as an office CPU for the departments and branch locations of large corporations, according to Tom Black, marketing manager at HP's Roseville, Calif., operations.

Although it has enough port capacity to support up to 28 terminals simultaneously, the processor is expected to be used primarily by work groups typically consist-

*... the processor is expected to be used primarily by work groups typically consisting of eight to 10 concurrent users.*

ing of eight to 10 concurrent users, Black said.

As a work group machine, the Series 37 incorporates an intelligent network processor board that reportedly allows the CPU to serve as a departmental host for desktop personal computers like the IBM Personal Computer and the HP 150. The entry-level 3000 family member is also accessible by portable micros such as HP's recently announced Model 110, Black said.

In addition, the Series 37 has been certi-

fied to operate with four models of private branch exchanges and can be networked with larger CPUs because of its ability to support the X.25 communications standard and IBM's Systems Network Architecture, he said.

As its name suggests, the Series 37 falls somewhere in performance between IBM's System/36 and System/38 and replaces the HP 3000 family's previous entry-level model, the Series 39, Black said. Other current members of the HP 3000 line include the Series 42, 48 and 68, the last of which reportedly executes at .68 Mips.

All four models of the HP 3000 family use HP's MPE V/E operating system and are compatible with each other at the object-code level, Black said. Thus, Series 37 users who wish to upgrade their systems to some larger member of the processor line can reportedly do so without having to rewrite any application programs.

Consistent with its role as an office pro-

See HP page 73

■ EMC Corp. announced a 64K-byte memory subsystem for users of Digital Equipment Corp.'s VAX-11/780/70

### INSIDE

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Board-Level  
Devices/73

## Celerity: 32-bit engineering unit faster than VAX-11

SAN DIEGO — Celerity Computing has announced the C1200, a 32-bit workstation that the company claims offers up to twice the performance of Digital Equipment Corp.'s VAX-11/780 superminicomputer.

Based on the firm's proprietary Accel microprocessor, the unit has been designed around a 32-bit chip set developed by NCR Corp. The C1200 uses a specialized version of the Unix operating system that incorporates features of the University of California at Berkeley's Release 4.2.

Available in November, the C1200 is said to execute up to 2M single-precision

and 1.5M double-precision Whetstone instructions per second and reportedly performs at 1.5 to 2 times the performance of a VAX-11/780.

### Aimed at design engineering

Aimed principally at design engineering applications, the unit supports Accelnet, Celerity's integrated networking product, and can be used to communicate with other systems using the Ethernet local-area network, the vendor said. The C1200 can accommodate up to 24M bytes of physical memory, the vendor said.

A basic configuration, including an ex-

tended floating-point processor, a 56M-byte disk drive, a streaming-cartridge tape drive and 2M bytes of random-access memory costs \$45,000 and will be marketed primarily to OEMs and large systems integrators, the company said.

A 1,280- by 1,024-pixel resolution display subsystem is available for \$27,600. A 640- by 480-pixel display subsystem costs \$8,800, according to the vendor spokesman.

Additional information is available from Celerity Computing, which is located at 9692 Via Excelencia, San Diego, Calif. 92126.

## IBM price cutting puts squeeze on PCMs



**HARD TALK**  
Tom Henkel  
CW Senior Editor

A week after IBM slashed prices on its 3080 line of mainframes, makers of compatible systems, National Advanced Systems Corp. (NAS) and Amdahl Corp., followed suit.

There were no real surprises in the price cuts. Everyone expected NAS and Amdahl to counter IBM's action swiftly. It has become a tradition. In fact, with rumors flying that IBM's next line of high-end mainframes is on the horizon, both NAS and Amdahl were probably gearing up to make price cuts anyway.

But the latest round of price cuts raises the question of what long-term financial impact IBM's aggressive pricing tactics may have on NAS and Amdahl.

Each time IBM shaves another 10% off the purchase price of a mainframe, Amdahl and NAS must at least match the action. Often, apparently in a move of one-upmanship, the companies will counter each 10% IBM price cut with 12% or 15% cuts. All this means is that NAS and Amdahl wind up having to settle for smaller profits on each system sold.

Strong ties with Japanese CPU manufacturers give NAS and Amdahl the slight advantage of somewhat cheaper labor. If the plug-compatible manufacturer (PCM) CPUs cost less to manufacture, it follows that the PCMs have a more comfortable range in which they can adjust prices.

But Amdahl and NAS buy their CPUs from Fujitsu Ltd. and Hitachi Ltd. While the Japanese manufacturers have close ties with their U.S. distributors, the Japanese surely make a profit on each CPU shipped to the U.S. And it is questionable whether Japanese labor is that much cheaper to give Amdahl and NAS a significant advantage over IBM. Consequently, both NAS and Amdahl are limited as to how much they can cut prices and still turn a profit.

IBM, on the other hand, can take advantage of its gargantuan size. IBM sells everything from typewriters to mainframes. It has reeled in federal contracts that would make the average computer salesman drool. It is the largest single supplier of software in the world. And its research and development budget overshadows most companies' total worth. In short, there are many ways IBM can, and does, make up for price cuts on its mainframe line. Amdahl and NAS do not have that luxury.

While IBM's 3080 and compatible mainframes are clearly headed out to pasture, that does not

See PCM page 73

## Report says proper MIS focus on service

By Donna Raimondi  
CW Staff

MOUNTAIN VIEW, Calif. — Despite constant demands to perform systems development and maintenance, successfully managing an information system involves transforming the organization into a service and advisory department, rather than an in-house software development facility.

This is one of the conclusions of the "1984 Information Systems Planning Report" recently released by Input, Inc., a market research firm specializing in software and services.

Aimed at planning managers and heads of MIS organizations, the study stated that the information systems budget growth rates are increasing (11% in 1984 vs. 7% in 1983). The primary reasons for the increase are the proliferation of end-user computing and the growing demand for access to corporate data bases. The overall budget growth is paced by increases in expenditures for personal computers (18%) and mass storage devices (13%).

The growth of microcomputers in corporations has presented executives with problems. Computing expenses are no longer centralized in one department, and the growing use of individ-

See SERVICE page 72



## SYSTEMS &amp; PERIPHERALS

## EMC unveils subsystem for VAX-11

EMC Corp. has announced a 64K-byte memory subsystem for the Digital Equipment Corp. VAX-11/780 superminicomputer.

Said to be equivalent to DEC's MS780-E, the EMCVT-780-4MB subsystem is intended to be a field replacement for the original 16K-byte random-access memory (MS780-C) in older VAX-11/780s or to be an add-on upgrade, the vendor said.

When installed as an add-on, the subsystem is configured in a CPU Expander Cabinet, which also houses two option slot assemblies for peripheral adapters.

The subsystem consists of a 20-slot backplane, a minimum of 4M bytes of memory, power supply and related hardware. The subsystem can be installed without modification to either DEC's VMS or AT&T's Unix operating system, the vendor said.

The price of the EMCVT-780-4MB subsystem installed in the CPU cabinet is approximately \$27,000, the vendor said. When used as an add-on subsystem with 4M bytes, EMCSYS-780-4MB, the system is \$31,000, including the expander cabinet.

EMC is located at 12 Mercer Road, Natick, Mass. 01760.

### DATA STORAGE

#### GENERAL ROBOTICS CORP. MSV11-Q

General Robotics Corp. has announced three versions of its MSV11-Q memory module. The unit is available in 256K-, 512K- and 768K-byte versions.

The MSV11-Q is a 255 nsec read-access parity memory module, plug-compatible with the Digital Equipment Corp. LSI-11 Q-bus CPUs, the vendor said. The product is said to be compatible with DEC operating systems.

LSI-11-based systems can be configured to a maximum of 4M bytes of main memory. In most cases, the MSV11-Q can be supported in addition to previously installed memory; disk and tape controllers provided by the company use the block-mode direct memory access feature of the MSV11-Q, according to the vendor.

Prices for the MSV11-Q are: \$2,775 for the 768K-byte version, \$2,350 for the 512K-byte version and \$1,925 for the 256K-byte version.

General Robotics, 57 N. Main St., Hartford, Wis. 53027.

### TERMINALS

#### NORTHWEST DIGITAL SYSTEMS GP-29

Northwest Digital Systems has announced the GP-29

graphics terminal. The unit is said to feature compatibility with Tektronix, Inc. graphics and Digital Equipment Corp. text-mode operation.

Available as a stand-alone terminal or as a retrofit board for the Zenith Data Systems Corp. Z29 terminal, the GP-29 features 128K bytes of memory and dual-memory plane operation, allowing overlay of two separate images on the screen, the vendor said.

In the graphics mode, the GP-29 terminal is said to offer both 512- by 250-pixel low-resolution and 1,024- by 500-pixel high-resolution operation, as well as zoom, pan, area fill, area move, area drawing and area erase functions.

The GP-29 is compatible with the Tektronix 4014 display terminal and can employ the graphics software packages written for Tektronix terminals, according to the vendor.

In the text mode, the GP-29 is said to be compatible with the DEC VT100 and VT220 terminals. Standard display formats are: 80 lines by 24 char., 80 lines by 49 char., 12 lines by 24 char. and 132 lines by 49 char.

Users can store up to 75 pages of text in off-screen memory, the vendor said.

The price of the GP-29 terminal is \$1,695, and the price of the GP-29 retrofit board for the Zenith Z29 is \$995.

Northwest Digital Systems, P.O. Box 15288, Seattle, Wash. 98115.

#### HEURIKON CORP. Minibox

Heurikon Corp. has announced the Minibox, a multiuser workstation based on the Motorola, Inc. 68000 microprocessor. The unit comes with a built-in C compiler and four or six Intel Corp. Multibus card slots.

The workstation also features 31.2M bytes to 140M bytes of Winchester disk storage, expandable to 420M bytes, the vendor said.

The Minibox workstation is built around the company's HK68 microcomputer, which provides a floppy disk drive controller, Winchester and tape interfaces, four to

eight serial ports and 750K bytes of random-access memory (RAM) in two Multibus card slots, the company said.

The Minibox is said to have two forward and two rear disk drive bays; the forward bay can contain one or two 5¼-in. floppy drives above, with a 5¼-in. Winchester or tape drive below; the rear bay can contain one or two 5¼-in. Winchester drives.

The price of the workstation, with a 30M-byte hard disk, 1M-byte floppy disk and 1M-byte of RAM, is \$15,675, the vendor said.

The company also announced that the HK68 micro

Continued on page 72

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## DJC Recommends The Diablo 630 Series

David Jamison Carlyle recommends the Diablo 630 Series.

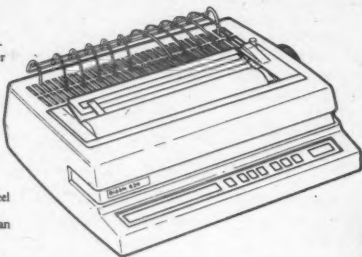
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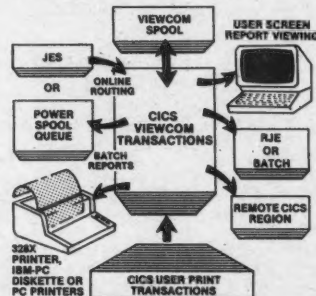
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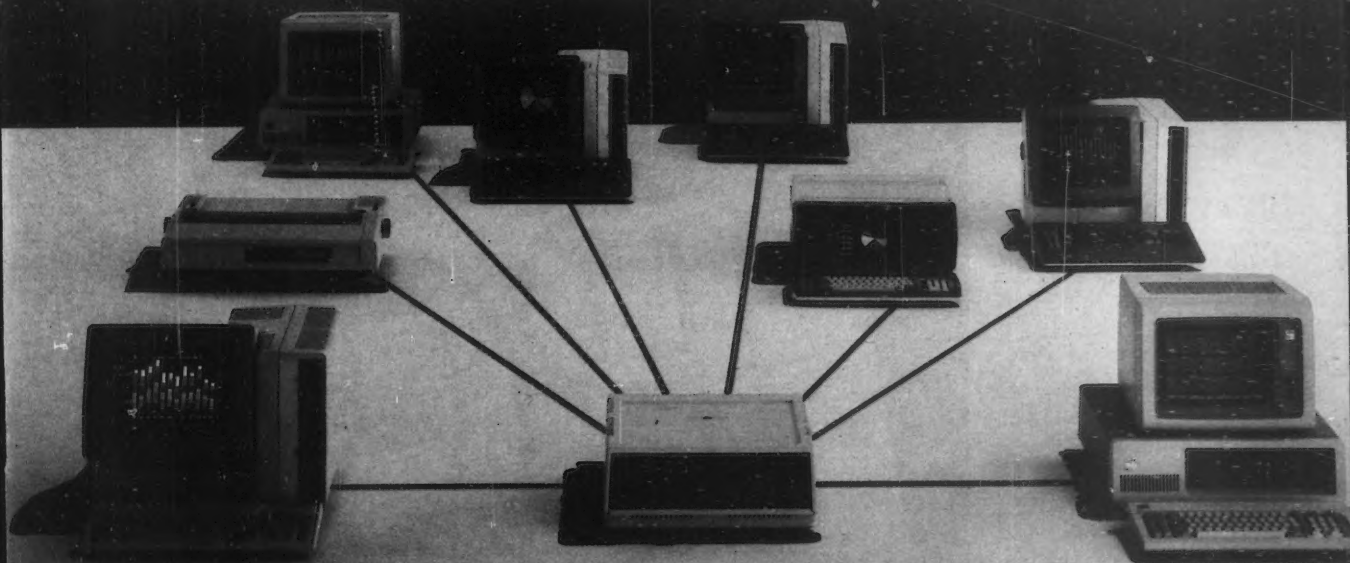


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## SYSTEMS &amp; PERIPHERALS

Continued from page 70

is now available with 512K bytes or 1M byte of RAM on an add-on card. The price of a 1M-byte card is \$5,495, the vendor said.

Heurikon, 3201 Latham Drive, Madison, Wis. 53713.

#### ANN ARBOR TERMINALS, INC. XL series

Ann Arbor Terminals, Inc. has announced the four-model XL series of Ansi-standard terminals.

The Genie+Plus XL is offered with a 30-line by 80-col. display format and conversational and form-filling modes, the vendor said.

The Ann Arbor Ambassador XL, with 60-line by 80-col. display format, is intended for word processing applications. The Ambassador GXL is said to enhance the XL model with Tektronix, Inc.-compatible vector graphics for engineering and research and development applications.

The Guru XL is said to add more than 28K bytes of memory and user-selectable display formats of up to 66 lines by 170 char. for spreadsheet and text-editing applications.

The XL series features 768- by 600-pixel resolution; a 15-in. non-glare amber, green or white phosphor screen; and a low-profile, 110-key keyboard.

Video features include slow scroll, keyboard pause control and a dynamically selectable display capability that allows the user to zoom more data onto the screen locally for context or move data off the screen to increase character size, the vendor said. Visual attributes include normal, reserve, video, bold, blink, un-

derline and security.

The series offers the RS-232C interface operating at up to 19.2K bit/sec, the vendor said.

Genie+Plus XL is priced at \$1,395; Ambassador XL at \$1,595; Ambassador GXL at \$3,090; and Guru XL at \$2,395, the vendor said.

Ann Arbor Terminals, 6175 Jackson Road, Ann Arbor, Mich. 48103.

### PRINTERS

#### COMPUTER TRANSCIVER SYSTEMS, INC. Execuport 1200 series

Computer Transceiver Systems, Inc. has announced the Execuport 1200 series of printers, each weighing less than 10 lbs and printing at

speeds up to 240 char./sec with a resolution of 240 dot/in.

The Model 1205 parallel printer prints at a speed of 120 char./sec on thermal paper, with a Centronics Data Computer Corp.-compatible parallel connector. The printer reportedly has a buffer of approximately 1,000 char. and an option to expand buffering to up to 7,000 or 15,000 input characters, the vendor said. An Ascii character set is provided, and users can change character sets with cartridges, the vendor said. The 1205 is priced at \$995.

The Model 1210 serial printers adds an RS-232 interface to the 1205 model. Data may be received at speeds from 110 bit/sec to 9,600 bit/sec, the vendor said. The price of the 1210 is \$1,045.

The Model 1220 features a built-in AT&T 212/103-compatible modem. It

is said to be capable of direct interface to a telephone line for remote receipt of electronic mail, the vendor said. The 1220 is priced at \$1,395.

The Model 1230 is equipped with serial and parallel printer interfaces and has a built-in 300 bit/sec to 1,200 bit/sec AT&T 212/103-compatible modem, the vendor said. The 1230 reportedly is graphics-compatible with Epson America, Inc. printers in some modes. The price of the 1230 is \$1,330.

The Model 1240 is a serially interfaced printer with built-in 300 bit/sec to 1,200 bit/sec AT&T-compatible modem. In combination with a CRT, the model functions as an intelligent workstation, according to the vendor. The price of the 1240 is \$1,395.

Computer Transceiver Systems, P.O. Box 15, E. 66 Midland Ave., Paramus, N.J. 07652.

### SERVICE from page 69

ual computers raises the problems of data integrity and security.

The high demand for corporate computing creates an opportunity for information systems departments to become strategically important organizations. But to do so, many departments must overcome a tarnished reputation as an impediment to the accomplishment of corporate goals, according to the report.

In addition to changing its focus from a development to a service organization, the study suggested information systems departments should offer more advice with regard to corporate computing. The report also indicated that the information systems department should become more solution-oriented.

Research for this report was based on 250 interviews with information systems organizations in 10 major industry sectors. Major vendors were also interviewed to provide the basis for analysis of hardware, software and communications trends.

The body of the report is an analysis of information systems budget levels categorized in two different ways: first, by company size measured in revenues, budget authority or assets; and second, by industry sector.

The "1984 Information Systems Planning Report" is available for \$2,900 from Input, 1943 Landings Drive, Mountain View, Calif. 94043.



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## SYSTEMS &amp; PERIPHERALS

## BOARD-LEVEL DEVICES

GENERAL ROBOTICS CORP.  
Cobra/16

General Robotics Corp. has announced the Cobra/16, a single-board CPU said to be compatible with Digital Equipment Corp.'s PDP-11 mini-computer. The unit is based on DEC's J11 16-bit CPU.

The Cobra/16 includes 1M byte of random-access memory, a disk controller for interfacing two Storage Module Drive-type disk drives, a tape controller for two streaming tape drives and a multiplexer for up to 32 asynchronous lines. A direct-memory access facility is said to handle high-speed data transfer between all system components. The Cobra/16 will run standard DEC operating systems

including RT-11, RSX11-M and RSTS/E, as well as TSX, TSX-Plus and Unix, the company said.

Available to systems integrators, the Cobra/16 costs \$6,000 in OEM quantities, the company said.

General Robotics, 57 N. Main St., Hartford, Wis. 53027.

## GRAPHICS SYSTEMS

## INOVION CORP.

## Personal Graphics System

Inovion Corp. has announced the Personal Graphics System, a stand-alone graphics generator that offers a 780K-byte memory and a choice of 2.1 million colors said to be simultaneously displayable.

The system provides a resolution

of 512 pixels by 480 pixels on a 19-in. monitor, with an icon menu overlay plane driven by a mouse or trackball, the company said.

Features include a frame grabber/digitizer, said to enable the user to take a signal from a television, video cassette recorder or video camera and digitally freeze the picture for further manipulation; synthetic color routines to allow the user to change the color saturation or hue of individual pixels or sets of pixels; software offering brushes, line patterns, line functions, geometric figures, fill, microscope editing and fonts; and an RS-232 port to allow interfacing with most personal computers.

The price of the Personal Graphics System is \$3,495, according to the vendor spokesman.

Inovion, 195 E. Gentile St., Layton, Utah 84041.

## HP from page 69

cessor; the Series 37 can be powered from an ordinary 110V wall outlet, requires no air conditioning, can operate on carpet and reportedly produces less noise than a typewriter.

In addition to the processor itself, a Series 37 system incorporates at least one 55M-byte HP 7945A disk module, which, with an average seek time of 30 msec, is said to store data 35% less expensively than its most technologically advanced HP predecessor, the 7933 storage module.

A basic Series 37 configuration incorporating a 512K-byte processor, 55M-byte HP 7945A disk module, system console and 67M-byte cartridge tape backup unit sells for \$19,950. For an added \$6,500, the CPU's main memory can be expanded to its maximum capacity of 2M bytes. The HP 7945A costs \$7,500.

HP is headquartered at 3000 Hano-ver St., Palo Alto, Calif. 94304.

## PCM from page 69

mean the market for those systems will dry up overnight. Even after IBM's mysterious Sierra is announced, there will still be users migrating up the 3080 line. And many of those users will be calling on NAS and Amdahl to offer bids to counter IBM's.

The market just below IBM's latest and greatest system has always been strong for the PCMs. The users who realize that they will not be migrating to the top of the IBM line for some time have less of an incentive to huddle closely under the Big Blue product umbrella. But, in this marketplace, the PCMs must also compete with sellers of used IBM gear.

IBM does not appear interested in dabbling in the market for old systems. If anything, the frequent price cuts seem aimed at selling off as many older systems as possible before attention is focused on a newer line. But in the process, IBM appears to have continually narrowed the profits Amdahl and NAS can make on each system.

Not making as much money as IBM is a condition almost everyone has to live with. For many companies, a sliver of the IBM profit pie translates into a handsome living. But in the case of Amdahl and NAS, lower profit margins cut into the amount of money available to fund the R&D projects necessary to remain competitive with IBM mainframes.

If that happens, IBM will once again have free run of the main-frame business.

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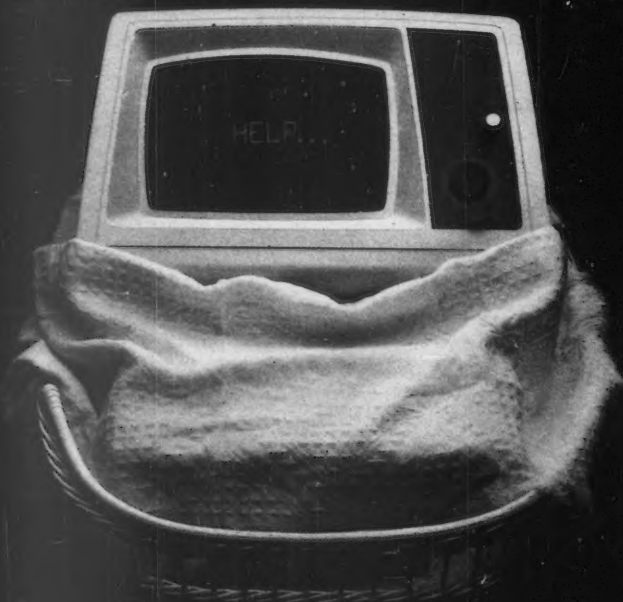
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# MICROCOMPUTERS

## HP 110 micro garners early user plaudits

By Edward Warner  
CW Staff

FULLERTON, Calif. — Early users of Hewlett-Packard Co.'s HP 110 lap-size microcomputer are impressed: One user raved about the machine's portability, while a major oil company bought 150 HP 110s for its salesmen.

At Hughes Aircraft Co. located here, the human resources department was so pleased with its tryout of the 272K-byte, 16-bit HP 110 that it is considering buying seven of them, one for each of its top managers.

The managers will use the machines, which are equipped with built-in Lotus Development Corp. 1-2-3 spreadsheet software, to spot trends in employee data, such as the rise and fall of job-related accidents or labor grievances, and to generate memos and letters using its built-in word processing software, said Renzo Venturo, the department's manager of environmental and data systems.

Venturo used the HP 110 for three weeks to see if it was what his department needed: a portable microcomputer that would integrate with the five Hewlett-Packard HP 150 micros already in use. The HP 110 worked out well in the office, but Venturo said he really knew he was hooked on the 8½ pound micro when he found himself taking it home in place of a briefcase.

See HP page 92

## Cinmill control system built around IBM 5531

CINCINNATI — Cincinnati Milacron, Inc. has announced Cinmill, a computer numerical control system based on the IBM 5531 Personal Computer, a factory model of the Personal Computer XT.

The new system "is the first control system to bring commercial computing capabilities to machines on the factory floor and to link them to the factory office," according to the company.

Cinmill can run either machine-center control programs developed by Cincinnati Milacron or commercial IBM software, the company said. The system reportedly can be linked either to other machining centers on the shop floor or to IBM systems in the shop office, permitting managers to track production and maintain inventory lists.

"We see Milacron's choice of the IBM 5531 as a significant step toward our goal of total factory integration," said Everett Van Hoesen, IBM president for industrial systems. "This step places IBM equipment at every run of the integration ladder, from individual machines on up."

Cincinnati Milacron is the first OEM to announce plans for the 5531, IBM said. Cinmill was a cooperative development project for IBM and Cincinnati Milacron, the largest U.S. supplier of machine tools.

A system including the IBM 5531 with 640K bytes of random-

See 5531 page 92

■ Software Publishing Corp. introduces the PFS:Plan spreadsheet/76

■ Venturcom announces a new release of the Venix/86 operating system/76

■ Logical Software, Inc. unveils Softshell, a full screen interface for AT&T's Unix/76

### INSIDE

Software/76

## Diagnostic products let users assess state of disk drives

By Kathleen Sullivan  
CW West Coast Bureau

SAN JOSE, Calif. — Duane Meulners is worried about the state of your disk drives.

Meulners — founder and president of Dymek Corp., a six-year-old company here that designs test equipment for floppy disk drives — thinks you, too, should worry about dirty heads, improper alignment, self-erasure, inability to write, damaged gaps, poor clamping and high system noise.

He cited one overriding reason for concern: An improperly functioning disk drive threatens disk interchange — the ability to create a file on one computer and then use the same disk in another system

without data loss.

Users cannot take disk interchangeability for granted, Meulners warned. In fact, he believes that users should test their disk drives on a daily basis to ensure that they are working properly.

Although other industry experts said Meulners was overstating the problem, Meulners described it as a "tickling time bomb," saying that the difficulties a faulty disk drive creates are not always immediately obvious.

"A user can successfully operate a computer for a long period of time, creating programs and adding the disks to a software library," Meulners said. "Eventually, the user will discover the need to change the drive and plug in a new one. At that

point, the user finds out the old drive was not in satisfactory alignment, and the disks he created cannot be read on the new drive or if they can be read, the drive will obliterate adjacent records."

Similarly, users will have problems exchanging disks if their disk drives are improperly aligned, he said.

According to Meulners, the number of disk drives that have failed Dymek's interchange test in the company's field tests is "absolutely alarming," with more than 30% failing to make the grade.

Meulners attributed the problem in part to the fiercely competitive personal computer market. As prices fall for disk drives and computers, he said, many companies

See DRIVES page 89

## IBM remains committed to PC-DOS despite PC Xenix offering for AT

By Kathleen Sullivan  
CW West Coast Bureau

ANAHEIM, Calif. — When IBM unveiled the Personal Computer AT in mid-August and announced it would offer the multiuser PC Xenix operating system with the computer, some observers said the announcement signaled a change in direction for IBM, whose single-user PC-DOS has become the industry standard for personal computers.

But in a speech delivered early this month at the National Software Show in Los Angeles, Robert Markell, vice-president of software development and publishing for IBM's entry systems division, emphasized to attendees that IBM's commitment to PC-DOS remains strong.

The company's adoption of PC Xenix does not reflect any change in its perception of the importance of PC-DOS, according to Markell.

The move does, however, indicate

IBM's interest in what Markell described as the "significant demand" and "substantial market" for computers running versions of AT&T's Unix operating system.

### Personal Computer AT

The Personal Computer AT, which offers faster processing speed, more user memory and greater disk storage capacity than the rest of the units in IBM's personal computer line, also runs PC-DOS Release 3.0, which is an enhanced version of the operating system.

"In no way have we reduced our efforts on PC-DOS," Markell said. "In fact, we have increased them. We will continue to make applications software and system enhancements available to support PC-DOS," he said.

Markell added that the company will position itself in the multiuser

See PC-DOS page 92

## PC Network: Industry implications



MICRO BITS

Thomas W. Madron

IBM's introduction of the PC Network on Aug. 14 ended part of the speculation about local-area network intentions at the computer industry's Goliath.

The PC Network announcement confirmed rumors that one IBM network offering would be a broadband, CATV-based system developed by Sytek, Inc., of Mountain View, Calif. As I suggested in an earlier column, PC Network uses carrier-sense multiple access with collision detection, an access meth-

od similar to that used by Ethernet.

A statement of direction accompanying the introduction also affirmed a commitment to two other networks, a token-ring net and an industrial net using the token-bus protocol. (It is not clear what a token-bus protocol might be, but one example of a system described by that term is Datapoint Corp.'s Arcnet.)

IBM's PC Network announcement also featured a reaffirmation of the company's commitment to Synchronous Data Link Control/Systems Network Architecture (SDLC/SNA) as a large-scale networking scheme.

The announcement's implications are manifold.

First, because IBM has placed its imprimatur on a broadband system, that technology will now become respectable within the data processing community.

See IBM page 88

Madron is manager of computer services at North Texas State University, Denton, Texas.

## MICROCOMPUTERS

## Enhanced Venix/86 out

CAMBRIDGE, Mass. — Venturcom, Inc. has released Venix/86 Encore, an enhanced version of Venix/86, the company's rendition of AT&T's Unix operating system.

The enhancements reportedly allow programs that require more than 64K bytes of storage to run on a variety of microcomputers. Several programs can now be stacked in physical or random-access memory and accessed by one or more users.

Venix/86 Encore is said to allow copying of Microsoft Corp. MS/DOS and Unix files among partitions of a hard disk. This feature makes it possible to write MS/DOS files in a Unix format and vice versa.

The new package also includes an

enhanced version of ABD, a Unix debugger that identifies problem areas in compiled programs and kernel libraries and allows for adding standard and nonstandard peripherals.

Venix/86 Encore runs on a number of microcomputers including IBM's Personal Computer, AT&T's 6300, Zenith Data Systems Corp.'s 150, Texas Instruments, Inc.'s Professional and NCR Corp.'s Personal Computer. The product also supports plotters from Hewlett-Packard Co. and Epson American, Inc.

Venix/86 Encore costs \$800. Current users can upgrade from Venix/86 for \$30.

Venturcom is located at 215 First St., Cambridge, Mass. 02142.

## Interface from Logical Software allows access to Unix programs

CAMBRIDGE, Mass. — Logical Software, Inc. has announced Softshell, a full-screen interface that provides users with direct access to programs running under AT&T's Unix operating system.

Softshell provides templates to facilitate the choice of commands, a structured walk to traverse the Unix file system and context-sensitive help screens.

Softshell divides the screen into two parts, window and scroll. If the user knows a specific Unix command, he reportedly can enter the command in the scroll. When the command is unknown, templates displayed in the

window lead the user to the desired command, according to Logical.

The product includes a "Yelp" command that categorizes Unix commands by function and presents the classification with a brief description in a window format.

Softshell's cost ranges from \$295 to \$995, depending on which CPU is required. The \$295 price is for the IBM Personal Computer XT, while the \$995 price is for Digital Equipment Corp.'s VAX-11 minicomputer line.

Logical Software is located at 17 Mount Auburn St., Cambridge, Mass. 02138.

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## Spreadsheet unveiled for IBM micros

MOUNTAIN VIEW, Calif. — Software Publishing Corp. has introduced PFS:Plan, a spreadsheet program that runs on the IBM Personal Computer.

With the program, users can develop budgets, balance sheets, income statements, cash flow statements and financial models, Software Publishing said.

PFS:Plan reportedly uses keywords to perform calculations, such as cumulative year-to-date totals, growth projections, payment on loans, averages and net present and future values.

The program has quick-entry keys that enable a user to generate row and column headings which consist of consecutive months, days, quarters or years by depressing one key, according to the vendor.

All typing is done inside the spreadsheet itself rather than on the command line as in most spreadsheets. Column sizes automatically adjust to accommodate data, and column and row headings are always displayed, the company added.

PFS:Plan costs \$140.

Software Publishing is located at 1901 Landings Drive, Mountain View, Calif. 94043.

## SOFTWARE

**THOUGHTWARE, INC.**  
Management training programs

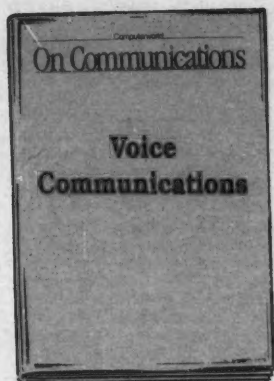
Thoughtware, Inc. has introduced two management training programs for the IBM Personal Computer and the Apple Computer, Inc. Apple IIe, IIc and II+ microcomputers.

The programs, Improving Employee Performance and Performance Appraisal, reportedly may be used separately or to supplement each other. Improving Employee Performance reportedly can be used to identify, analyze and solve the performance problems of subordinates, according to the vendor. Users reportedly are shown how to conduct performance discussions.

Performance Appraisal is said to  
Continued on page 78



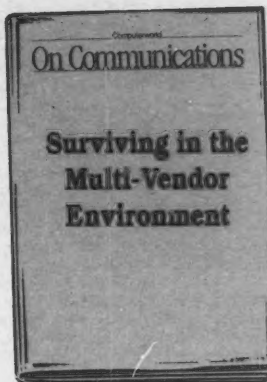
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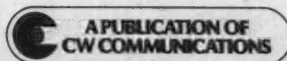
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**BOSTON:** Maureen Sebastian, 375 Cochituate Road, Box 880, Framingham, MA 01701 (617) 879-0700

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**SOUTHERN CALIFORNIA:** Jayne Donovan, 18004 Sky Park Circle, Suite 244, Irvine, CA 92714 (714) 250-1305

**NORTHERN CALIFORNIA:** Chris Clyne, 1060 Marsh Road, Suite C-200, Menlo Park, CA 94025 (415) 329-8220



## MICROCOMPUTERS

Continued from page 76

show managers how to define performance objectives, monitor employee performance and conduct legal performance appraisals.

Each program costs \$350, the vendor said.

Thoughtware, 2699 S. Bayshore Drive, Coconut Grove, Fla. 33133.

#### INSURANCE TECHNOLOGY CONSULTANTS

Submit

Insurance Technology Consultants has announced Special Underwriting Brief and Management Information Tool (Submit), a tracking mechanism that allows a property underwriter to determine if risk information had previously been submitted.

The product includes, among other things, a business directory with the names and addresses of companies, carriers and underwriters.

Submit reportedly allows an underwriter to capture information describing the risk, the underwriting action taken and other user-defined data.

The product is written in Ryan-McFarland Corp.'s Cobol and requires 128K bytes of random-access memory, IBM's PC-DOS operating system, two floppy disk drives, an 80-col. monitor and Ryan-McFarland's Runtime Cobol.

Submit costs \$295.

Insurance Technology Consultants, P.O. Box 6610, Fullerton, Calif. 92634.

#### JMI SOFTWARE CONSULTANTS, INC.

Enhanced C Executive

JMI Software Consultants, Inc. has announced an enhanced version of C Executive, a real-time monitor suitable for read-only memory use.

The new release is said to support up to 1M byte of physical address space required by Intel Corp.'s 8088, 8086 and 80186 microprocessors.

C Executive reportedly allows multiple C and/or Pascal tasks to run concurrently with intertask communications, resource coordination and formatted I/O. Other features include real-time clock support, time-based

task initiation and other real-time application features.

Included with the product are 100 routines for dynamic memory management, character string manipulation, formatted I/O and Ascii-to-numeric conversion.

C Executive costs \$500 plus \$75 for documentation and media.

JMI Software Consultants, P.O. Box 481, 904 Sheble Lane, Spring House, Pa. 19477.

#### BUSINESS PRO

Sav Key

Business Pro has introduced Sav Key, a backup system that consists of software, preprinted labels and floppy diskettes and is designed for the IBM Personal Computer XT.

Sav Key prompts the user to backup work with menu-driven, on-screen instructions that specify which diskette to use.

A backup log reportedly tracks what was copied, when it was copied and where it was stored, while a second record lists the contents of each backup diskette.

The product reportedly speeds daily data backup by copying only changed or added material while copying all data on a monthly basis. If data is lost for any reason, Sav Key is said to possess step-by-step instructions for restoring it.

Sav Key costs \$149.

Business Pro, P.O. Box 44075, Phoenix, Ariz. 85064.

#### THE DESKTEK GROUP

OSRT-PC

The Desktrek Group has introduced OSRT-PC, a multitasking, real-time operating system said to retain the features of IBM's PC-DOS operating system and to run on the IBM Personal Computer.

The operating system supports functions necessary for process management, dynamic control of interrupts, memory allocation and processor-to-processor communications.

OSRT-PC reportedly is written in C, requires only 10K to 12K bytes of memory and has 256 priority levels. The product can be linked with application programs and run under PC-DOS as a single task.

The operating system is primarily geared to OEMs.

OSRT-PC costs \$9,600 for an unlimited binary machine license.

The Desktrek Group, 830 E. Evelyn Ave., Sunnyvale, Calif. 94086.

#### MAI/BASIC FOUR BUSINESS PRODUCTS CORP.

Upgrade kits

MAI/Basic Four Business Products Corp. has announced upgrade kits for its accounting software that reportedly allow the packages to operate in the IBM Personal Computer AT multi-user environment, on the IBM PC Network or in a single-user environment.

The MAI VM-Xenix and network upgrade kits are said to eliminate the need to change existing programs to make them compatible with more powerful configurations and allow two or more users to work simultaneously on the same files.

Internal record and file-locking safeguards are provided, along with task-to-task semaphores, which prevent users from executing conflicting tasks at the same time.

The MAI VM-Xenix upgrade kit and MAI network upgrade kit are each priced at \$995.

MAI/Basic Four Business Products, 601 San Pedro N.E., Albuquerque, N.M. 87108.

#### LELAND COMPUTER SERVICES, INC.

Trust Manager I

Leland Computer Services, Inc. has introduced Trust Manager I, a trust accounting system for the IBM Personal Computer and Personal Computer XT.

Trust Manager I reportedly combines general ledger accounting with a user-defined chart of accounts and data base management utilizing Ashton-Tate's Dbase II. It reportedly contains all of the processing and reporting functions of a standard trust accounting system.

Trust Manager is priced at \$4,995, including classroom training and documentation.

Leland Computer Services, Suite 146, 8601 Dunwoody Place, Atlanta, Ga. 30338.

See SOFT page 82

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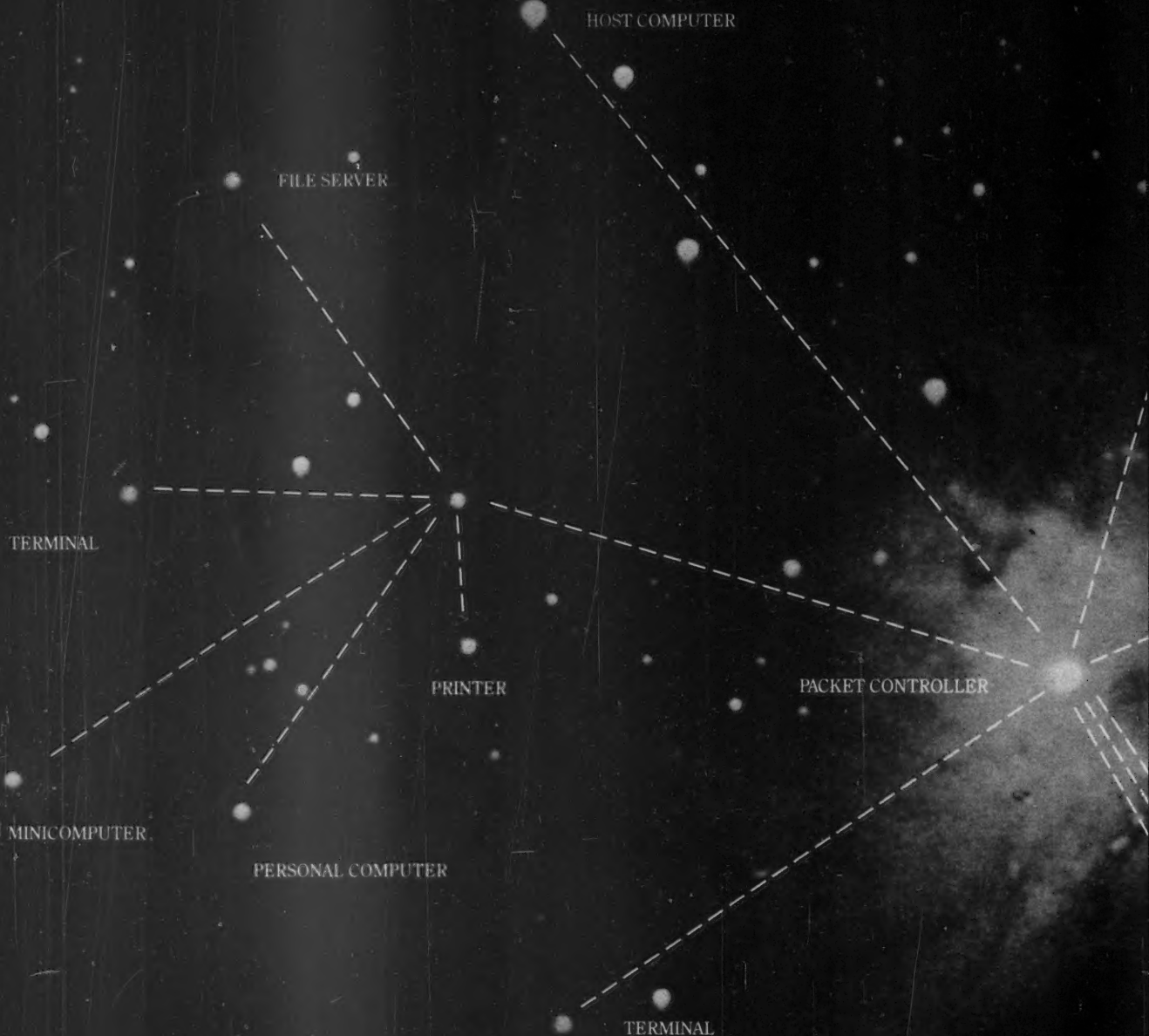
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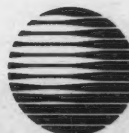
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executives' names, titles, and phone numbers. An index provides quick access to 133 cross references by hardware, software and industry. Price-\$370. Call (212) 683-0606. Computer Management Research, Inc. 20 Waterside Plaza, NY, NY 10010.

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## MICROCOMPUTERS

### SOFT from page 78

#### LAHEY COMPUTER SYSTEMS, INC. F77L

Lahey Computer Systems, Inc. has announced F77L, a Fortran 77 compiler that runs on the IBM Personal Computer and is said to be designed for programmers who want mainframe features.

The program reportedly

contains many IBM "H" features, including a dollar sign in a name and eight-character names.

F77L has optional checking of subscript and a sub-program class.

Each source file is said to have a free format, with comments beginning with an asterisk and continuation lines starting with an ampersand.

The compiler requires 256K bytes of random-access memory and an Intel Corp.

8087 coprocessor.

*Lahey Computer Systems, Suite 417, 904 Silver Spur Road, Rolling Hills Estates, Calif. 90274.*

#### INTEGRAL SYSTEMS, INC. Orgchart; Caaps

Integral Systems, Inc. has announced Analytic Organizational Charting (Orgchart) and Criterion Affirmative Action Planning Systems (Caaps), four-module human resource applications that run on the IBM Personal Computer.

With Orgchart, users reportedly can create and modify organizational charts with information extracted from a mainframe Integral Systems package data base or a microcomputer data base.

Caaps combines census and available employee information with Integral Systems personnel data to produce a set of affirmative action planning reports required for Equal Employment Opportunity Commission and Office of Federal Contract Compliance Programs, according to the vendor.

The programs require 256K bytes of random-access memory and IBM's PC-DOS operating system.

The cost of each Orgchart or Caaps module ranges from \$4,000 to \$12,000.

*Integral Systems, 165 Lennon Lane, Walnut Creek, Calif. 94598.*

#### LEXISOFT, INC. Spellbinder/Scientific for HP 150

Lexisoft, Inc. has announced a version of its Spellbinder/Scientific word processing program that runs on Hewlett-Packard Co.'s HP 150 microcomputer.

The software reportedly allows users to mix text and scientific symbols on a screen. A key feature is the ability to create, display and print characters designed by the user.

Spellbinder/Scientific is said to permit inserting and deleting of characters within a formula as the program adjusts spacing to fit the alteration.

The package displays and prints formulas of any size, including those that span several screens or lines.

The software also handles chemical diagrams, including four-, five- and six-member rings.

Spellbinder/Scientific costs \$295 and runs with Spellbinder.

*Lexisoft, Box 1378, Davis, Calif. 95617.*

#### HIGH TECH MARKETING, INC. High Tech Business Graphics

High Tech Marketing, Inc.  
Continued on page 84



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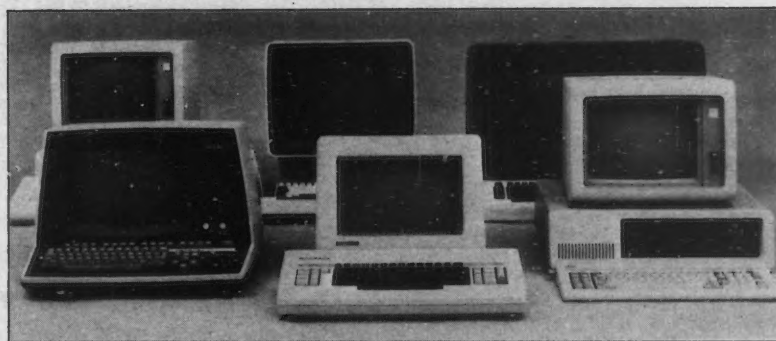
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# Making multi-vendor office systems work together requires just one thing.



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The idea seems simple enough: connect all of your office systems so that documents can be freely interchanged for editing, storage, display, and printing. That includes word processors, PCs running word processing packages, and mainframe terminals accessing DCF and PROFS.

Many vendors claim to connect multiple vendors' equipment through "protocol translation." And connect they can, but not communicate. To really communicate requires transforming the document coding so that it is fully editable at the receiving system.

### Soft-Switch is compatibility

ITI's Soft-Switch is a program product for your IBM mainframe (MVS or VM) that allows users to send documents to other users with document translation performed automatically, to store documents in host libraries, and to retrieve documents from these libraries.

Soft-Switch communicates with IBM, Wang, Xerox, and NBI. It communicates with the MultiMate word processing program on the IBM PC, with DCF and with PROFS; with the IBM 6670 laser printer, and with standard hard copy printers.

Soft-Switch is totally consistent with evolving standards for office systems. In fact, Soft-Switch integrates multi-vendor office environments by first translating a document into IBM's level 3 Document Content Architecture (DCA), and then into the exact format required by the receiving workstation.

### Soft-Switch solves today's problems

Let's say an analyst prepares a document on his PC with MultiMate. He executes Soft-Switch (which executes in the PC, as well as in the IBM host) and specifies distribution to his secretary's Wang word processor and to the 6670 laser printer down the hall. Soft-Switch provides the micro/mainframe link, transports the document from the PC to the IBM host, translates

the document from MultiMate format to DCA, translates the DCA format to Wang's WPS format and the IBM 6670 laser printer OCL format, and routes the documents to their final destinations.

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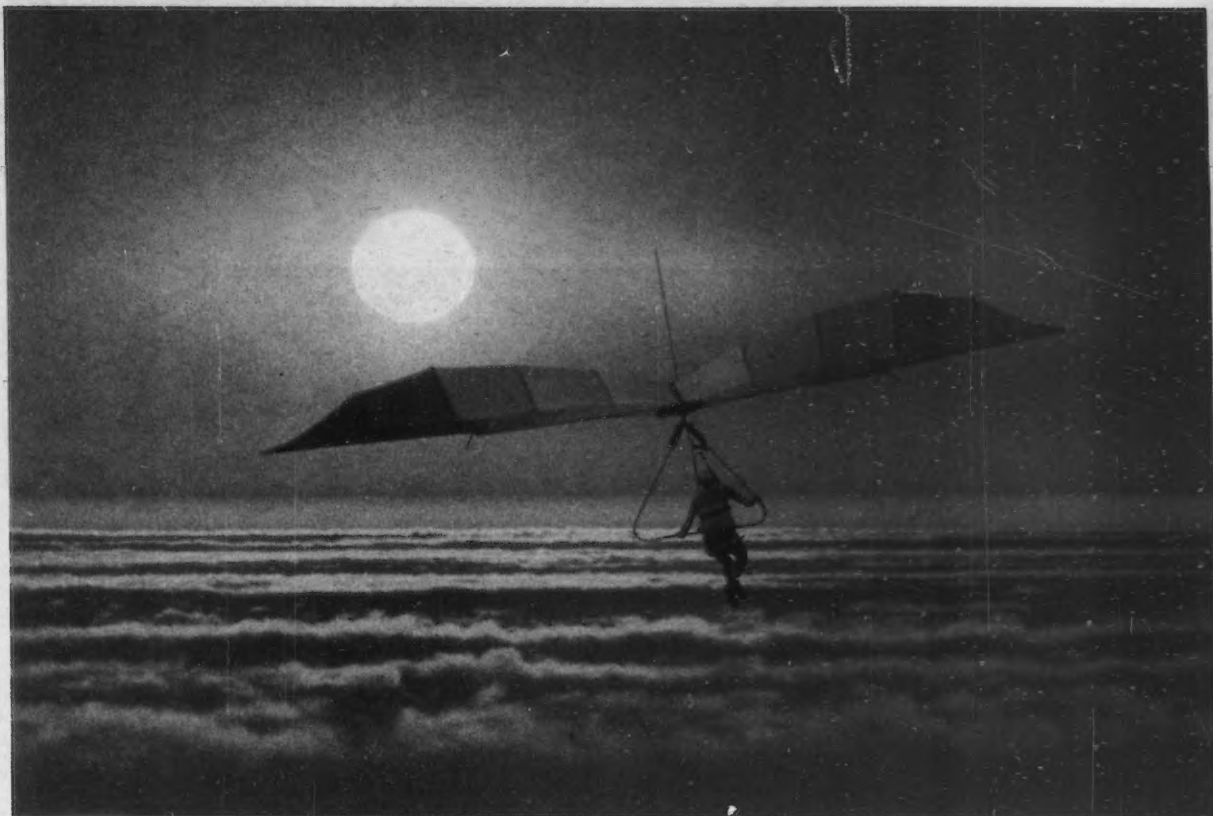
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Computerworld 9/17/84

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## MICROCOMPUTERS

Continued from page 84

nology, Inc. has announced enhancements of its System for Integrated Materials Analysis-100 (Sima-100) package for the IBM Personal Computer and Personal Computer XT.

Sima-100 reportedly now offers the capacity to store and format data for any type of report format.

The package also works in conjunction with the vendor's Extended Materials Test Data Base Management

module, which allows storage of materials testing data from standard or custom-designed test programs, according to the vendor.

Sima-100 reportedly features an embedded data base structure that permits storage by batch, test, test properties and sample. The Sima-100 system costs \$3,350 in its basic configuration. The data base manager costs \$2,300.

Systems Integration Technology, 244 Vanderbilt Ave., Norwood, Mass. 02062.

#### PROFILE ANALYSIS CORP. Riskpac

Profile Analysis Corp. has introduced the Riskpac computer security decision support software package, which runs on the IBM Personal Computer and Personal Computer XT with at least 128K bytes of internal memory.

Intended for systems designers, data security and audit personnel seeking to im-

plement system controls, Riskpac reportedly guides a user through a set of questions about the data processing environment, hardware and application systems.

The package is available as a basic survey and reporting tool or as a custom system. The basic system is priced at \$595, but customizing the package could cost up to \$5,000, depending on the number of installations.

Profile Analysis, 440 Main St., Ridgefield, Conn. 06887.

#### DRIVES from page 75

cannot afford to test drives with the same rigor they once did.

However, industry analysts and media manufacturers generally challenged Meulners' assessment. While they agreed that preventive maintenance was a sound idea and that improperly aligned disk drives could create problems, they did not agree with Meulners' emphasis on the problem.

Kenneth Lim, analyst with Dataquest, Inc., a market research firm based here, agreed that disk drives do "tend to go out of whack" over time. But Lim said that occasional maintenance is sufficient to catch problems.

"There's certainly a need for diagnostic equipment for disk drives, since they do get out of calibration periodically," said Walker Mannes, analyst with Creative Strategies International, Inc., a market research group here. "But frankly, I would question whether the problem is that widespread. If it was, we would have heard users raising a hue and a cry everywhere."

#### Testing software

Dymek recently introduced a software program designed to test a variety of factors that affect disk interchangeability, the Recording Interchange Diagnostic, joining several other companies that have similar products on the market.

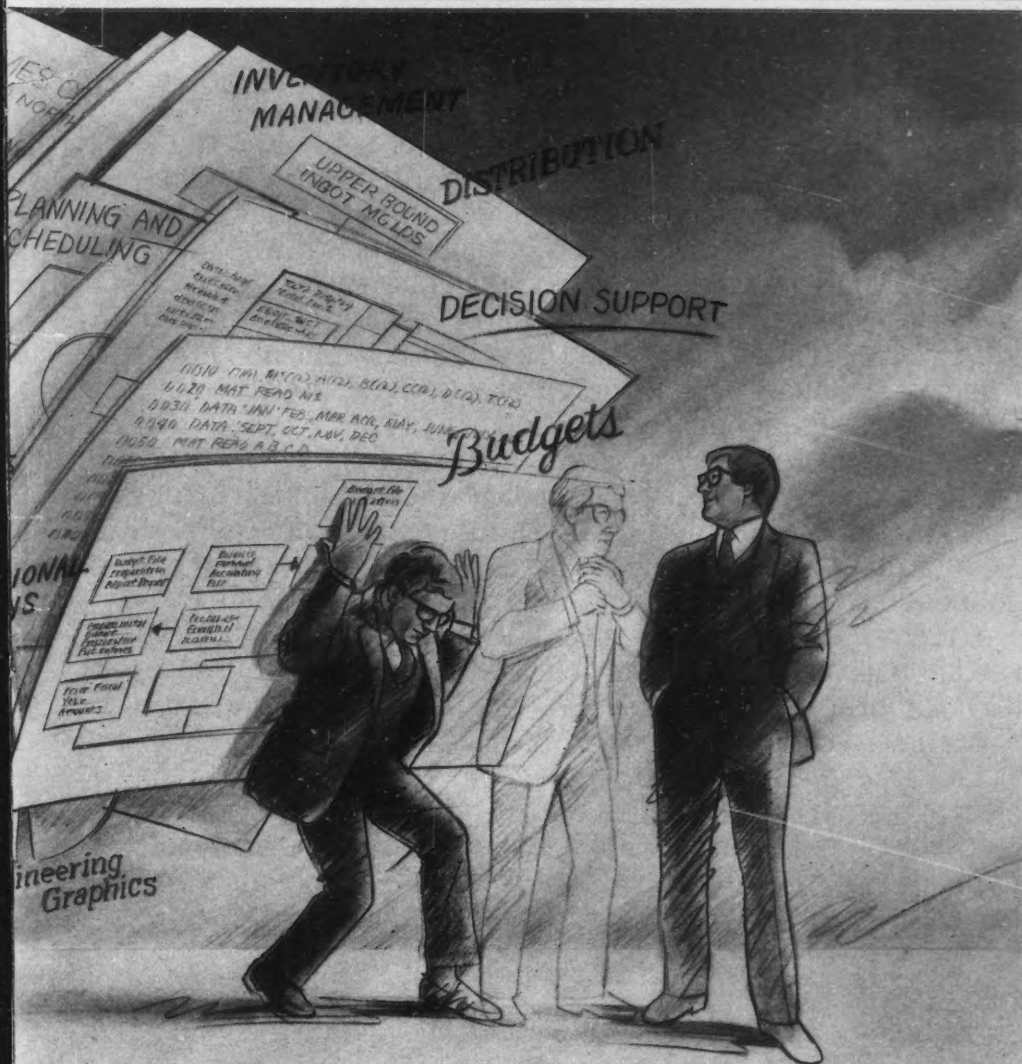
Rick Davis, product marketing manager for Data Encore, a Sunnyvale, Calif., company that sells a diagnostic program for IBM and Apple Computer, Inc. computers known as the Datalife Disk Drive Analyzer, agreed that a disk drive needs regular maintenance.

A disk drive "tends to go out over time" because it is a mechanical device, not because it was poorly manufactured in the first place, he said.

Dysan Corp. in Santa Clara, Calif., also sells a diagnostic package for personal computers, called the Interrogator. Elizabeth Dessuge, product manager, said users are turning to the use of diagnostic disks because they are becoming more "computer-wise."

Users want to know more about the operation of their computers and get involved in maintaining them, she said.

Each company recommended a different maintenance schedule. While Dymek's Meulners promoted daily testing of disk drives, Data Encore's Davis suggested a weekly test for stand-alone computers and more frequent tests of a portable computer. Dysan's Dessuge said that monthly preventive maintenance should meet the needs of most users.



Design (JAD) and subsecond response time, they achieved a 40 percent improvement in productivity for their first project, an online financial accounting application.

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# The pc software to use if you have IDMS/R.



At last count, there were more than 50 integrated personal computer software packages. But for companies with IDMS/R, we'd like to suggest that only one really makes sense.

GOLDENGATE,<sup>™</sup> Cullinet's pc software package, integrates seven components: database, spreadsheet, graphics, document processing, 3270 terminal emulation, asynchronous communication and information manager. While the software is exceptional on a standalone basis (see facing page), it offers an additional benefit to pc users in an IDMS/R environment—true micro-to-mainframe integration.

Not the kind that requires a mastery of complicated command structures. Not the kind that provides a link with only a small portion of mainframe data.

Through the Information Database (IDB), the Cullinet software product that serves as the foundation for corporate information management, a GOLDENGATE user can have direct, "transparent" access to all data stored in the IDMS/R database, with no additional work required to get it. The user simply requests and manipulates IDB mainframe information in the same way information on the pc is stored and manipulated. It's that simple.

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Complete  
Software  
Solution

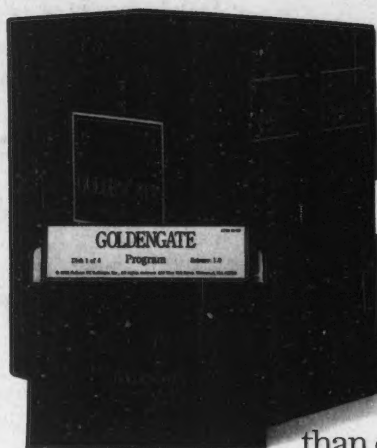


GOLDENGATE and IDB are key components of Cullinet's complete approach to information management. You can find out about them by attending a Cullinet Seminar. To make arrangements, phone, toll-free, 1-800-225-9930. In MA, the number is 617-329-7700.

## Cullinet

We understand business better than  
any software company in business.

# The pc software to use if you don't have IDMS/R.



GOLDENGATE™ is the logical choice for IDMS/R users (see facing page). But what about in non-IDMS/R environments? How does Cullinet's integrated pc software stack up against the more than 50 competitive packages on the market today?

With all due respect to those other packages, we'd like to suggest that it stacks up *best*. You see, GOLDENGATE is fundamentally different in design than other integrated pc software packages.

Most software developers achieve integration by designating one specific function to serve as a "metaphor" for the entire program—an approach that consumes memory and inevitably creates compromises in functionality. Cullinet, on the other hand, chose to provide the *optimum* environment for each and every function in the program. When a GOLDENGATE user is doing word processing, he does it using a superior word processing tool. And so on. What's more, all tools, including new ones under development, are built around core software that integrates the tools and facilitates transfer of information among them.

Going further, we designed a command structure that makes each of these extremely powerful modules extremely easy to use, because they all share the same commands. The net result is a simple one: integrated software that works better, because each of its components works better. All without placing excessive demands on the system configuration.

To find out more, we encourage you to attend a Cullinet Seminar. To make arrangements, phone, toll-free, 1-800-225-9930. In MA, the number is 617-329-7700.

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## MICROCOMPUTERS

**PC-DOS** from page 75

market by offering PC Xenix, which "represents an extremely attractive set of functions and utilities."

PC Xenix (a version of Microsoft Corp.'s Xenix) is scheduled for delivery in the first quarter of 1985. So are two other major products also unveiled in August: the IBM PC Network (a broadband local-area network) and the PC Topview operating environment software.

In an effort to encourage independent software developers to design software products for the Personal Computer AT, IBM offered a series of technical seminars in conjunction with the National Software Show. The seminars covered the architecture of the AT (which is based on the Intel Corp. 80286 microprocessor), provided an overview of the PC Network and gave an introduction to PC Topview.

**HP** from page 75

"I almost took it camping with me — that's how enamored I was," he said.

The HP 110 was a better choice for managers than the HP 150 or a similar desktop micro, Venturo said, because managers spend only about 10% of their workday in front of a micro and also need to be able to take work home with them, a case for portability.

Venturo said he often took

the HP 110 home with him and once found himself using it to revise spreadsheet data "right in the middle of commercials" on television.

The major U.S. oil company bought 150 of the HP 110s for use by salesmen in its chemical products subsidiary. The micros will be used to forecast sales data and for word processing.

**Distributed 40 units**

So far, 40 of the HP 110s have already been distribut-

ed, said a company executive, who asked that neither he nor his company be named.

One of the 110s, he said, went to a sales representative in Singapore, who is using the unit's built-in modem to send messages and data to the firm's U.S. headquarters, a scheme that saves on long-distance telephone costs.

The oil company salesmen, meanwhile, will also use their new HP 110s to dial into the corporation's in-house time-sharing system, which is based on several mainframes, including an IBM 3084.

Hughes Aircraft's Venturo, though, said his firm is unlikely to be downloading data to the HP 110s from its Hewlett Packard 3000 mini-computer.

**Reasons for purchase**

The oil company executive said his firm chose the HP 110 over other lap-size models, such as the Radio Shack TRS-80 Model 100, because of its Intel Corp. 8086 16-bit processor and what he said were the HP 110's higher quality peripherals.

He said his only complaint with the HP 110 was its 16-line by 80-char. LCD display and predicted that a better screen will eventually be offered.

Venturo, though, said the screen's size, roughly 3 by 10 inches, was not a major problem because of the limited amount of time executives would spend looking at it each day.

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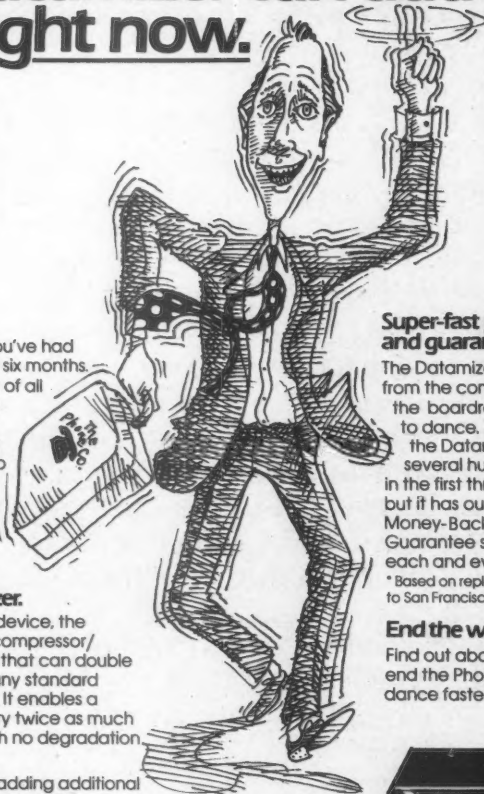
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\* Based on replacing 2 New York to San Francisco DDS lines.

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"Don't get me wrong, Fred. I do like your computer work. It's you I don't like."

# COMPUTER INDUSTRY

## Health probe, advice follow arsine death

By John Desmond  
CW Staff

BURLINGTON, Mass. — After an investigation into the June death of an M/A-Com, Inc. technician from arsine gas exposure, the Massachusetts Division of Occupational Hygiene found the company's safety precautions for changing arsine gas tanks to be satisfactory, but recommendations were made to improve M/A-Com's health and safety program.

John C. Bothwell Jr., senior vice-president of corporate development for M/A-Com, based here, said a federal Occupational Safety and Health Administration probe is ongoing, and he expects recommendations to result from that as well.

John Zemotel, 31, died at the Lahey Clinic Medical Center here 11 days after exposure to arsine gas. According to M/A-Com officials who interviewed Zemotel while he was in the hospital, the technician admitted inhaling the gas deliberately. However, Zemotel provided no reasons for doing so, and no one witnessed the incident, the company said.

M/A-Com, a telecommunications company with 2,600 employees, is involved in the development and manufacture of galli-

See ARSINE page 108

## FASB proposes capitalization of costs for software vendors

By Peter Bartolik  
CW Staff

STAMFORD, Conn. — The Financial Accounting Standards Board (FASB) recently proposed a rule requiring publicly held software vendors to capitalize certain software development costs, a change that would allow vendors to report higher profits by spreading out expenses over several years.

In the past there have been two methods of accounting for software development costs, making it difficult for investors and analysts to compare financial reports of different companies and leading the Securities and Exchange Commission in April 1983, to prohibit companies from changing from the "expensing" method over to the capitalization method.

According to executives of software companies and a financial analyst, capitalization of expenses allows software vendors to stagger the reporting of those expenses over several years, thus allowing more revenues in any given year to be reported as profits. Under the expensing methods, those industry participants said, costs are reported in the year they are incurred, resulting in what one executive termed "wild swings" in annual profits.

While the software industry, through a committee formed by the Association of Data Processing Service Organizations,

Inc. (Adapso), had urged a capitalization rule, the FASB proposal differs in some respects from a proposal written earlier by a task force of the American Institute of Certified Public Accountants that included the Adapso committee.

According to Greg Ray, an industry fellow with the FASB and project manager for computer software, the proposed rule would allow software firms to capitalize coding and testing expenses only from the point at which management determines the product is commercially feasible and costs recoverable. "Planning design" and establishment of technical feasibility of the product would be considered a research and development expense and not subject to capitalization, Ray said.

Julie Johnston, a staff member with Adapso, said the task force on which the Adapso members served "felt that [commercial] feasibility could be established prior to doing detail design work" on projects under development. "Detail program design and coding is so closely related, the task force felt it would be hard to separate the two," she added.

Lawrence J. Shoenberg, chairman of AGS Computers, Inc. and a member of the Adapso committee, said he had some concerns over the wording of various provisions in the FASB proposal. "The difficul-

See FASB page 109

*Gavilan*

Unwise marketing and management practices are said to be behind the recent troubles of struggling Gavilan Computer Corp./96

■ Apple Computer, Inc.'s Macintosh is the target of a trademark infringement suit filed by a small Pennsylvania software developer/98

■ More sophisticated data security software products could deter much of the computer crime prevalent today, National Security Agency officials said/102

## Ad market blitz: Vendors bombard media to sell, sell, sell



Dennison Manufacturing goes for network TV.



INDUSTRY INSIGHT  
Peter Bartolik  
CW Senior Editor

Computer industry vendors are stamping into the general advertising market like a herd of elephants.

Vendors are spending big bucks for television and print advertisements that will reach a large group of people among whom, vendors hope, are a number of impressionable computer users who will be mesmerized into buying products from companies that establish product identification.

Among the latest to stamp into the general market is Dennison Manufacturing Co. of Waltham, Mass., which recently claimed to have produced the first network television commercial for companies participating in the \$1 billion floppy disk market.

With an advertisement depicting a herd of elephants stamping through New York's financial district, the company hopes to distinguish its Elephant Premium Floppy Disks with the adage, "Elephants never forget."

Perhaps it was the still to be fully evaluated success of Apple Computer, Inc.'s coming out party for the Macintosh on national television during the past Super Bowl which prompted this trend. Apple, by the way, has just been sued for trademark infringement by a company claiming to have established rights to the trademarks "Mac," "Macs" and derivatives (see page 98).

Lotus Development Corp. and Ashton-Tate are slugging it out on the airwaves in an attempt to co-opt the integrated micro software market.

Management Science America, Inc.'s Peachtree Software, Inc. subsidiary is blitzing selected media markets with the line, "America's software

See BLITZ page 109

### FOR VAX USERS

#### HOW TO GET PROMOTED AND WIN ENEMIES



PACS system resource management software and recommended our company buy it.

Now everybody thinks he's a genius.

Dear J. L.:  
I want you to know that I was passed over for dp director because of you. That sniveling Cauldwell got the job instead. Why? Because he read about your

We now have chargeback billing for shared-cost of our VAX system usage. But so what? We now can monitor usage of resources for better capacity planning. But so what? Cauldwell didn't do anything but read about PACS in your stupid column.

Signed, Passed By

Dear Passed By:

I am really sorry to hear that you weren't promoted. The Cauldwells of this world always seem to be looking in the right place at the right time. And you are right, a tendency to peruse ads

in trade journals certainly does not make one a genius.

On the other hand, Cauldwell must have followed through and investigated PACS as a possible solution to your company's system resource management problems. Perhaps he knew that a good chargeback system was needed to increase user awareness of computer time costs. Or perhaps he knew that the dp department needed thorough reports on present system use in order to better allocate computer resources.

I really can't accept the blame for your being passed over. Would you have made inquiries as he did? Would you have discovered that PACS is the leading system resource management software for VAX/VMS users and that it's sold

by DEC? Sure, you could say that all Cauldwell did was pick up the telephone and call Signal Technology. But he was on the spot. That's the point.

It's too late for you, Passed By. My condolences. Next time, give Signal Technology a call. If you can't beat the Cauldwells, join them.

VAX is a trademark of Digital Equipment Corporation.

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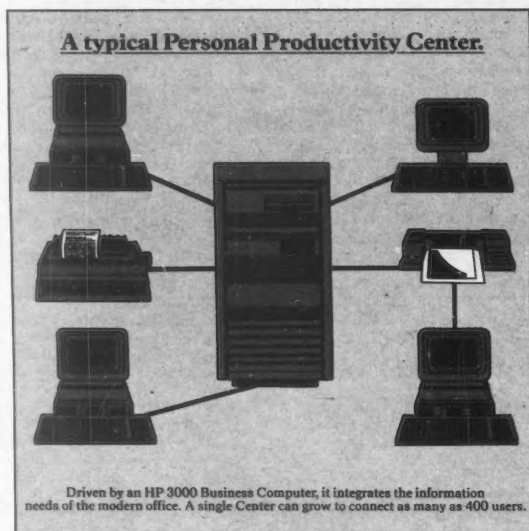
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The HP 3000 provides an interface for a wide variety of workstations, peripherals and personal computers, including our Touchscreen

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And the best news is that Personal Productivity Centers provide a very economical way of doing business. So if you want one system to raise productivity, instead of two, call your local HP office listed in the white

pages. Ask for a demonstration of the Personal Productivity Center. Or write for complete information to Susan Curtis, Hewlett-Packard, Dept. 003204, 19055 Pruneridge Ave., Bldg. 46T, Cupertino, CA 95014. In Europe, write Michael Zandwijken, Hewlett-Packard, Dept. 003204, P.O. Box 529, 1180 AM Amstelveen, The Netherlands.

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## COMPUTER INDUSTRY

# Gavilan seen foundering despite efforts to survive

By Kathleen Burton  
CW West Coast Bureau

CAMPBELL, Calif. — Though the market for briefcase-size portable computers is expected to soar during the next five years, Gavilan Computer Corp., once a technological leader in the field, may not be around to see it happen, industry observers said recently.

Plagued by management problems and reportedly in severe financial straits, Gavilan recently laid off 68% of its work force, canceled plans with SCI Corp. in Arkansas for volume manufacturing and cut prices on its portable computers by as much as 36%. Gavilan is being sued by several creditors, including Zilog, Inc., for

*'We're working hard to survive. The company is not at this time considering filing for bankruptcy.'* — C. W. Rea, president, Gavilan Computer Corp.

nonpayment of rent and Technitron, Inc., a printed-circuit board maker in Mountain View, Calif., for nearly \$124,000 in unpaid bills.

Some observers said that the foundering company ignored basic marketing and management practices. According to Robert Creager, a Gavilan founder and now vice-president of Chisolm Computers in Milpitas, Calif., a major problem was the cor-

porate tone set by cofounder and Chairman Manny Fernandez. "Manny never wanted to hear or discuss problems. It was built into the corporate culture and everybody had to go along with it," Creager said.

Creager said he left the company in January after disagreeing with Fernandez about "unrealistic" manufacturing schedules and management practices.

Federico Faggin, ex-president and chief executive officer of Zilog, said Gavilan's products had no definition and that management had not been effective. That, combined with tightened conditions in the venture capital market, made the "present [situation] inescapable," Faggin said, predicting that the company will be difficult to save.

Industry watchers are speculating that, if Gavilan is unable to locate a corporate buyer, they will be forced to file for protection under Chapter 11 of the Federal Bankruptcy Act within the month. A possible takeover bid by Eagle Computer, Inc. was reportedly abandoned two weeks ago, and Fernandez is "desperately" looking for venture capital, according to Brian Jeffery, an analyst at the International Technology Group, Inc., in Palo Alto, Calif.

"We're working hard to survive," said C. W. Rea, who took over as Gavilan president last month from his position as a partner in New Enterprise Associates, one of Gavilan's venture capital backers. Rea said that Gavilan is still working on repayment plans to its creditors and that the company is not at this time considering filing for bankruptcy.

Since taking over, Rea has cut prices on Gavilan's SC Mobile computer from \$2,995 to \$1,895 and on the Mobile computer from \$3,995 to \$2,895. He shifted the company's sales responsibilities from corporate executives to salesmen and focused sales away from the retail market and directly at OEMs and value-added resellers.

Rea did not publicly announce either the recent price cuts or the layoffs. The company is keeping a low profile, said Ken Churilla, an analyst at Creative Strategies, Inc. in San Jose, Calif., because the price cuts look like "the desperate moves of a company going out of business."

Ken Lim, an analyst at Dataquest, Inc. in San Jose, said that even though Gavilan's previous pricing was "way out of line with reality," Rea doesn't want to draw attention to the price cuts and layoffs "because it doesn't look good to investors. It affects their margin; they're making \$500 less per unit now," Lim said, "and that really looks bad."

Gavilan was among the first to announce a briefcase-size portable in April 1983, but due to manufacturing and technical problems with developing their integrated proprietary software, shipments were delayed for more than a year. Since then, the portable market has grown increasingly crowded, with Apple Computer, Inc., Hewlett-Packard Co., Epson America, Inc. and Sharp Electronics Corp. all introducing new portable computers this year, and Data General Corp. and IBM rumored to be close to announcing portable products.

During the past two years, Gavilan raised more than \$31 million in venture capital from West Coast investors including New Enterprise; Smith Barney Harris Upham Co.; Genesis Corp.; Roberts, Coleman & Stephens; and Associated Venture Investors.

"The company will make it. They're shipping hundreds of error-free units a month right now," asserted Dick Kramlich, a partner at New Enterprise, which has invested \$3 million in Gavilan.



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UCC-4. The hottest new number in the UCCEL line. UCC-4 is a hardware accounting system so advanced... it's taking the industry by storm.

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## COMPUTER INDUSTRY

# Apple's use of 'Mac' under attack in federal court

By Peter Bartollik  
CW Staff

VALLEY FORGE, Pa. — Users of Apple Computer, Inc.'s Macintosh microcomputer are probably well aware of Apple's Macpaint software package. They probably are unaware of another product called Paintmacs, but that product is one of the reasons Apple was recently named in a trademark infringement suit.

Paintmacs is an on-line screen generator package produced by a company called Management and Computers Services, Inc., which refers to itself in advertising and promotional materials as Macs and uses that acronym in the titles of 14 of its products used on computers ranging from

mainframes to Apple microcomputers. Macs (the company) also offers a Projectmacs package, while Apple offers a Macproject package.

Macs claims to have used that acronym since about 1969 and claims a number of U.S. trademark registrations for it and other titles dating back to 1972.

In an eight-count civil action suit filed Sept. 5 in a Philadelphia U.S. Federal District Court, Macs alleged that Apple has been and is currently engaged in trademark infringements,

*The decision to sue was 'a very serious decision for a company our size.'*

unfair competition, trademark dilution, trademark disparagement and trademark misappropriation. It has asked the court to enjoin Apple from using the designations "Mac," "Macs," "Mac's" and "Mac"

with a product identifier and "Macintosh" in connection with computer goods and services. It has also requested the court to order Apple to turn over to the court for destruction all materials bearing such identifiers and to turn over to Macs all profits realized through the use of those

identifiers.

Mick Schlegel, president of Macs, said he is concerned about price and credibility erosion resulting from the general association of the Mac acronyms with relatively low-priced microcomputer software packages.

Apple spokeswoman Barbara Krause said the company had not had an opportunity to review the lawsuit and could not comment on it.

Also named in the suit as a defendant was the McIntosh Laboratory, Inc. of Binghamton, N.Y., which Macs charged had filed a trademark registration for the name Macintosh under "false representations" by claiming McIntosh "controls the nature and quality of the goods to which the [Macintosh] mark is applied."

## 'A very serious decision'

Schlegel said the decision to sue was "a very serious decision for a company our size." He said he waited first to see whether Apple's much proclaimed "first 100 days" of marketing would be successful before deciding to go ahead with the suit proceedings.

He also said his attorneys communicated with Apple in attempts to mollify the issue, asking Apple to issue a press release recognizing his company's right to the name and stating Apple's intent not to refer to its products as "Macs."

"I followed the rules since 1966, and I think they should follow the rules, too," Schlegel said.

## DP firm, chief fined in export violations case

LOS ANGELES — A federal court judge here has ordered a computer company and its president to pay fines totaling \$30,000 for two violations of the U.S. Export Administration Act.

U.S. District Judge Harry L. Hupp fined the United Computadata Corp. of Los Angeles \$20,000 and placed the company on three years' probation. The company's president, Jong Hee Park, was fined \$10,000 and placed on five years' probation.

United Computadata and Park pleaded guilty last July to exporting a Perkin-Elmer Corp. 3252 superminicomputer to South Korea without a license and to altering a U.S. Department of Commerce license. The computer was valued at about \$230,000, according to U.S. Attorney Robert C. Bonner.

The sentencing is a result of an investigation by the Department of Commerce's Office of Export Enforcement. The violations reportedly occurred from March 1981 to April 1983.

In a related case, United Express Corp., a Los Angeles-based freight company, waived indictment and pleaded guilty last July to assisting illegally United Computadata and Park in exporting the Perkin-Elmer computer without obtaining a necessary license. Sentencing in that case is scheduled for Sept. 17.

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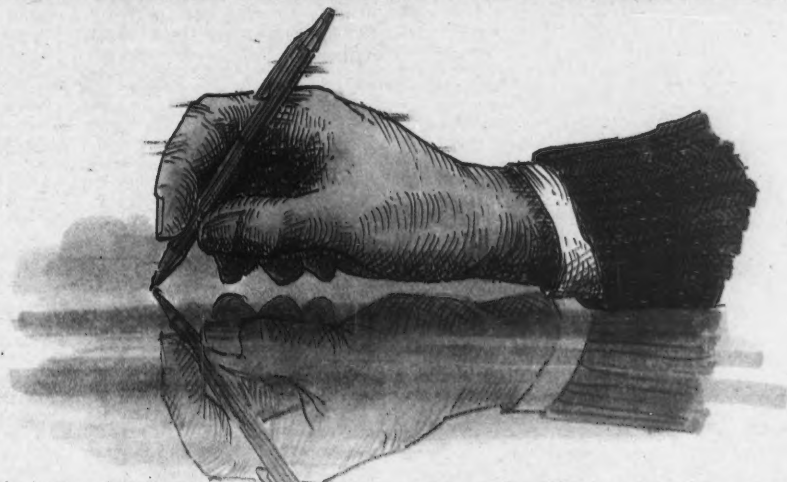
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## COMPUTER INDUSTRY

# Lasers gaining niche in production systems of future



**OUTSIDE LINES**  
Bohdan Szuprowicz

Since the 1960s, lasers have crept slowly but surely into use in medicine, military weapons, telecommunications, printing and manufacturing. Periodically, there have been enthusiastic predictions and forecasts about new industries and fortunes that were going to be built on lasers, but somehow after these bursts of media hype were dissipated into economic reality, the laser industry continued on its previous slow and steady course.

Industrial lasers have captured a number of market niches in a variety of machine shop operations such as cutting, heat treating of metals, measurement and soldering. Today, numerical control of machine tools and the new trends toward robotics and flexible manufacturing systems are opening up new vistas not previously possible for laser applications.

Flexible manufacturing systems, designed to run unmanned for long periods of time, are defined as groups of machine tools, with automatic tool changers under computer control, linked by automatic materials handling systems. They must be capable of processing and machining a variety of parts in relatively small batch-

es, which, in turn, requires the ability to measure, position and inspect different materials and parts quickly and without human interference.

Laser probes, which are already used primarily for inspection without contact of materials in process, offer a solution when integrated with measuring instruments. Such devices can be used to determine machining coordinates in computer-aided manufacturing (CAM) systems, providing higher accuracy and faster speeds of operation. Coupled with customized very large-scale integrated (VLSI) microchips with tiny optical sensors, they would be mandatory for unmanned supervision of large arrays of machine tools that make up flexi-

ble manufacturing system groupings and could lead to computer-integrated manufacturing facilities.

The acceptance of flexible manufacturing systems in the manufacturing industries of Europe and Japan has been faster than in the U.S. because of longer term planning strategies and a willingness to make fundamental changes in corporate, labor and marketing policies. Some of these innovations are making foreign machine tool industries more competitive. Since 1973, the U.S. has slipped from being the world's third largest machine tool producer to fourth place, while Japan has moved to the top spot, followed by the USSR and West Germany. The U.S. also became a large importer of foreign machine tools, which now account for about 36% of total annual usage by U.S. manufacturers.

## Defense industry dependent

Even the American defense industry is now dependent on imports for 33% of its machine tool needs, and there is mounting concern about the effect on national security of this dependence. As a result, the U.S. Air Force recently completed an extensive study of its manufacturing facilities and recommended that the Department of Defense should undertake a massive research and development effort to develop advanced domestic flexible manufacturing systems.

As these forces converge to boost innovation in the American machine tool industry and the development of competitive flexible manufacturing systems, suppliers of noncontact laser probes see a new growth market emerging for their products. In 1983, total sales of such laser systems amounted to only \$40 million, but industry insiders now feel these will most likely double every year during the mid-1980s. More enthusiastic industry observers believe that the market will even accelerate toward the end of the decade, growing at 200% annually for several years as manufacturing firms rush to modernize their operations with advanced flexible manufacturing and CAM systems. They point out that, since one-third of U.S. machine tools in use today are over 20 years old, this market offers unusual opportunities for industrial automation suppliers.

So far, this market segment is relatively undiscovered by the venture capitalists, but as factory automation gathers momentum, they are bound to become an important factor in this new investment area. At present, this is best understood by large manufacturers like General Motors Corp., which recently acquired an interest in Diffracto Ltd., a new venture in laser probes and robotic vision.

Established laser manufacturers are bound to benefit from the emerging market for specialized laser tools in factory automation, but there still appears to be plenty of opportunities for new ventures that can combine specialized machine tool experience with custom VLSI microchips and sensors, as well as laser tools.

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The TeleVideo® 750 letter quality printer is nothing short of revolutionary. In design. And in price.

Because the 750 delivers 50 CPS performance using an incredible 40% fewer parts than any comparable printer. It's not mere coincidence that the 750 sells for up to 40% less as well.

Cost of ownership gets even better with time. Fewer parts equal more reliability: an average of 65,000 pages between failures. And with the works in a drawer, repairs—when necessary—are quick and easy.

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You won't find a printer better suited than the 750 to an office environment. So if you're responsible for printer purchase decisions, the TeleVideo 750 should make your job significantly easier. No longer must you face the hard choice between performance and cost.

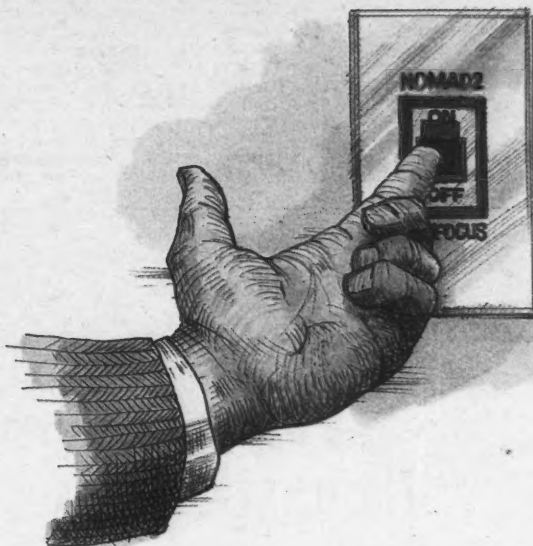
For information about TeleVideo Printer dealers in your area or a free demonstration, call 800-821-5992. In California, 408-745-7760.



*Szuprowicz is president of 21st Century Research of North Bergen, N.J., and publisher of Supergrowth Technology USA.*



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You might be wondering if the switch from FOCUS to NOMAD2 is worthwhile. It is and here's why. NOMAD2 has:

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## COMPUTER INDUSTRY

# National Security Agency calls for more secure software

## Vendors urged to produce products rating at least Class C on DOD security scale

By Mitch Betts  
CW Washington Bureau

FT. MEADE, Md. — Much of the computer crime prevalent today could be prevented by data security software products featuring need-to-know access control, user identification and authentication, accountability for user actions and tamper-proof audit trails, officials of the National Security Agency's (NSA) Computer Security Center said here in a recent interview.

"If we could just get a lot of Class C-2 systems out there, it would go a long way toward deterring computer crime," according to Sheila L. Brand, chief of computer security standards at the center, which operates under the aegis of the Department of Defense. A Class C-2 system, under the center's new classification system, would include those security features.

Tests conducted by the center's security experts have found that many existing computer systems are vulnerable due to easily guessed passwords, lack of accountability, modifiable audit trails and even security access controls that could be modified or bypassed.

The Computer Security Center here is encouraging vendors to produce software with at least Class C security features as off-the-shelf products for both the government and the private sector, according to Marvin Schaefer, chief scientist at the center.

Schaefer said the center, the only part of the secretive NSA with a largely unclassified mission, was established in 1981 to foster the development of secure computer systems through research, technology transfer, education and product evaluations.

### Center's mission

The center's primary mission is to ensure military and intelligence computers are secured against penetration by foreign powers, dissidents, businesses and organized crime, he said. But because the government obtains most of its computers from the private sector, "It makes sense to help the private sector make [all] computers as trustworthy as we want them to be," Schaefer said.

He maintained that the test-and-patch method of fixing security gaps in existing systems is deficient because there is no assurance that all security flaws have been found. The answer, he said, is to design verifiable security features into the system from the start.

Reflecting this philosophy, the center conducts preliminary evaluations during the development stage — to catch design flaws early — and then formal evaluations once the software is a final product, Schaefer said. Vendors can request an evaluation and obtain a rating under the center's classification system, which ranges from Division D (minimal protection) to Division A (verified protection).

Ultimately, vendors can use the center's ratings in their advertising and marketing efforts for security products, Schaefer confirmed.

Briefly, the classification system described in the center's Trusted

Computer System Evaluation Criteria document establishes these levels of computer security:

■ Division D: The DP operation relies on procedural and physical controls for security, not hardware or software controls.

■ Division C: In Class C-1, software provides need-to-know access control between users and files and requires identification of the user and authentication of the user's identity. Class C-2 adds features that prevent a user from scavenging through memory or storage for data; identify each user and establish accountability for actions taken by the user; and

establish an audit trail.

■ Division B: In Class B-1, data is labeled with sensitivity classifications (such as secret and top-secret) to control access. In Classes B-2 and B-3, a "reference monitor" embedded in the operating system directs proper access to the classified data, and a formal mathematical model for security policy is established.

■ Division A: The system design is verified so that there is assurance that the automated security functions operate as intended.

In recent testing by the center, IBM's RACF security software was rated at Class C-1, and SKK, Inc.'s

ACF 2 software was rated Class C-2, center officials said.

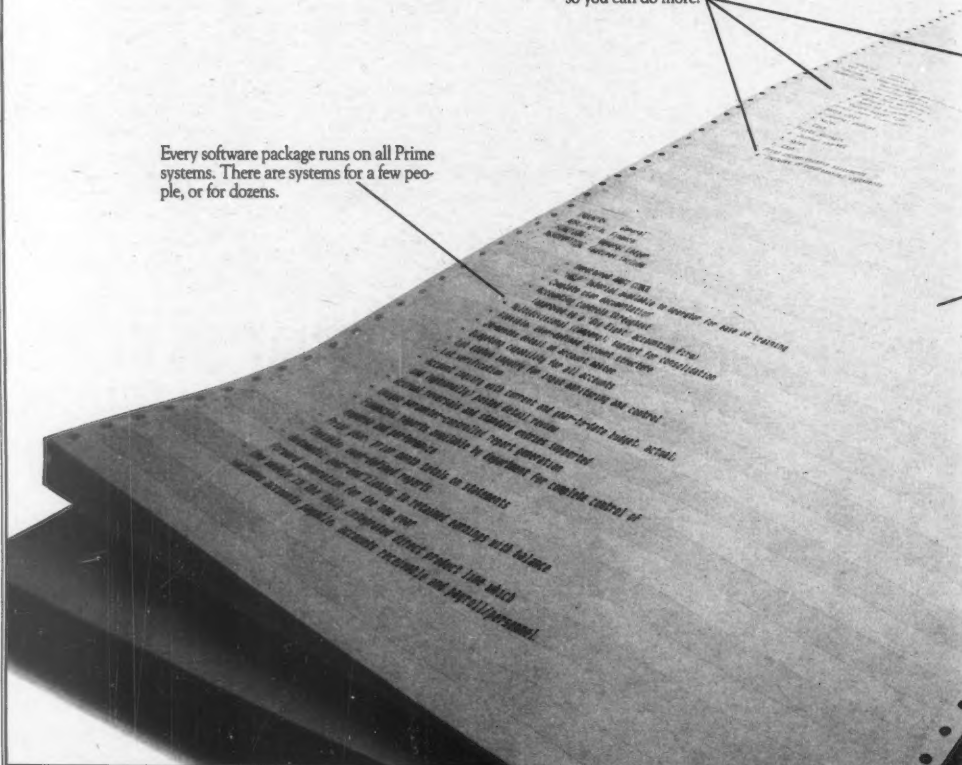
Meanwhile, evaluations continue on Honeywell, Inc.'s Scomp, targeted for A-1 classification; Honeywell's Multics, targeted for B-2 classification; Control Data Corp.'s NOS 2.2, targeted for C-2 classification; and CGA Computer Associates, Inc.'s Top Secret 3, targeted for C-1 classification.

Next year, the Defense Department plans to make the classification system a standard, and procurement officers will have to specify the security level for new computers, Brand said.

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## COMPUTER INDUSTRY

## Ashton-Tate names execs

CULVER CITY, Calif. — Ashton-Tate recently announced the appointment of several top executives and a corporate realignment into three operating divisions.

David C. Cole, president and chief executive officer, was named chairman of the microcomputer software concern, succeeding company co-founder and Chairman George Tate, who died last month.

Cole will continue to serve as chief executive officer, a title he has held since 1982.

Edward M. Esber, executive vice-president of marketing and sales, was appointed president and chief operating officer. He will report directly to Cole, the company said.

Norman H. Block, executive vice-president of finance and operations, was named executive vice-president of finance and administration.

The three new divisions are a software products group, an international unit and a business development group.

"The creation of divisions with distinct charters and responsibilities enables us to organize people within functional groups along product lines," Esber said. "This will allow each group to focus on specific markets and distribution channels."

Also announced was the appointment to the board of directors of Jill Weissman-Tate, formerly distributor sales manager for the company.

## Ashton-Tate revenue hike credited to Dbase, Framework shipments

CULVER CITY, Calif. — Ashton-Tate said its profit for the second quarter ended July 31 was \$682,000, or 7 cents a share, compared with \$149,000, or 2 cents a share, in the year-earlier period.

Revenues were \$19.1 million, compared with \$11.2 million for the same period a year ago.

Edward M. Esber, president and chief operating officer, attributed the increased revenues to initial shipments of the microcomputer software company's Dbase III, a data base management program, and Framework, an integrated business program.

Esber said quarterly profit was adversely affected by advertising and promotional costs associated with the Dbase III and Framework products, increased inventory write-down due to product changes and the cost of building a field sales organization.

## Computer Associates acquires Arkay

JERICHO, N.Y. — Computer Associates International, Inc. continued its recent acquisition spree with the announcement last week that it has acquired Arkay Computers, Inc., a Newton, Mass.-based developer and marketer of Focus, a DOS-to-MVS software conversion package. Terms of the transaction were not released.

It was the third acquisition in recent months for Computer Associates, which had earlier acquired Johnson Systems, Inc., a systems software vendor, and microsoftware vendor Sorcim Corp.

Charles B. Wang, president of Computer Associates, said the Arkay acquisition enables his company to "participate fully in a client's conversion process through the Focus package, as well as provide a comprehensive line of products for their [IBM] OS/MVS environment."

The Focus package has been renamed CA-Converter.

## Wang, Rolm compatibility pact announced

LOWELL, Mass. — Wang Laboratories, Inc. and Rolm Corp. have announced an agreement to pursue joint exploration of the compatibility of Rolm CBX II private branch exchanges (PBX) and Wang office automation computer systems.

The two companies will conduct tests to confirm the interconnectivity of current equipment. They also plan to define and test additional methods of connectivity and compatibility between Wang computers and Rolm PBXs, Wang said.

In a separate agreement, Wang announced a nonexclusive pact with Mitel Corp. to connect Wang computers over standard telephone wiring through Mitel's SX-2000 PBXs.



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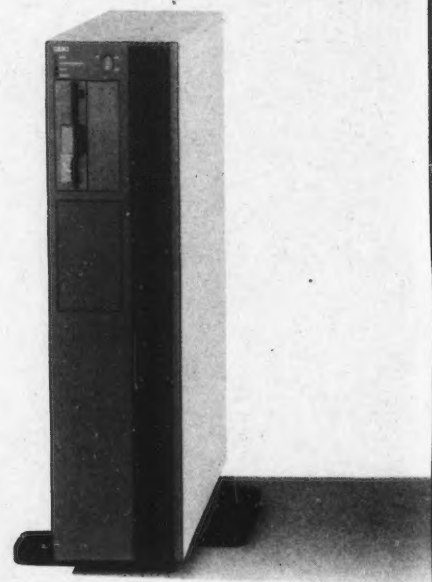
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# A SMALL BUT POWERFUL THE NCR



Nobody has to tell you that UNIX\* is one terrific operating system.

But to get the most out of it, you need one terrific box.

That's the NCR Tower.

## **A LOT OF COMPUTER FOR A LOT OF PEOPLE.**

The NCR Tower and Unix were made for each other. Just like Unix, the Tower is at its best in a multi-user environment.

Compare the Tower to the three-user IBM AT, for instance, and you'll find there's no comparison.

The Tower can handle up to twelve users simultaneously. And each user gets a lot more memory, a lot more storage and a lot more versatility. In short, a lot more computer. For a lot less money.

The Tower can even stand as part of a

nationwide distributed data processing network via SNA and other industry standard protocols.

Why does the Tower perform so well? Because it's built so well.

It is powered by the Motorola 68000, one of the most powerful 16-bit microprocessors around. To boost power even further, it has separate processors for disk, CRT and I/O controllers. And it comes with other guarantees of high performance like a Winchester hard disk and the Intel Multibus.\* As well as a unique power failure recovery system and battery back-up that enables it to survive power outages.

Put it all together and you've got a system with a storage capacity that expands from 40 million characters to 214 million. One that can handle everything

from color graphics, electronic mail and word processing to data base management and electronic spreadsheets. And one for which programs can be written in COBOL, BASIC, Pascal, FORTRAN and "C."

## **UNIX FOR BEGINNERS, INTERMEDIATES AND OLD PROS.**

Along with this impressive piece of hardware comes an equally impressive piece of operating software: the NCR-enhanced version of UNIX.

It's a more powerful and, at the same time, altogether more "friendly" operating system. It lets neophytes write their own programs while allowing highly experienced people the freedom to tap such resources as a cryptic command set structure.

What makes this possible is a design which features five different user interface

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# POWERFUL CASE FOR UNIX: TOWER.

levels. Called "shells," they keep users within the boundaries of their own abilities. One "shell" is for professional programmers who develop operating software; another is for EDP people who write complex application programs; a third is for system administrators; the fourth is for office procedures analysts and the fifth is for casual users (it's so simple, even a vice-president can use it).

Put simply, UNIX is a lot more valuable to a lot more people on the Tower.

## **INTRODUCING OFFICEWARE. A SUPER SYSTEM FOR OFFICE AUTOMATION.**

A great computer deserves great application software. And that's what you get with NCR OFFICEWARE.\*

One of its beauties is that it runs on

the Tower with IBM-compatible personal computers. So if you already have a slew of them, you can just hook up the Tower and supercharge them.

All of OFFICEWARE'S applications are integrated. Spreadsheets, text, graphs, data entry forms, phone messages and inter-office mail can be displayed concurrently on multiple windows.

OFFICEWARE even provides a link with the mainframe.

And OFFICEWARE is easy to use. Ridiculously easy to use. SOFT KEYS and PROMPTS guide the user through all operations. Effortlessly.

Quite simply, OFFICEWARE may be the most comprehensive office automation system available today. And it's only available on the Tower, a computer with enough power and versatility to handle your needs. Both come to you from NCR, a company committed to applying innovative computer technology to today's business problems. And one which offers its customers support and service from 1,200 offices in 120 countries.

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The NCR logo consists of the letters "NCR" in a bold, sans-serif font, enclosed within a rectangular border.

## **INNOVATIVE COMPUTER TECHNOLOGY. YOU CAN EXPECT IT FROM NCR.**



## WHAT'S BEHIND OUR CONVERSATIONAL TERMINAL MAKES WHAT'S IN FRONT OF IT MORE PRODUCTIVE.

At Teletype Corporation, we just made another intelligent move. We added an integrated modem to the 5410 conversational terminal—making it an even better value.

In addition to saving desk space and being cost-effective, the modem gives the 5410 “built-in” intelligence that greatly improves operator productivity. For example, all the operator has to do is push a single key, and the modem will dial a host computer and perform the logon operation. And the operator can store up to three phone numbers and logon strings in the modem. Automatic answering is another feature of the modem, which is 212A compatible.

The 5410 is also now available with a white, green or amber Phosphor.

No matter which color you choose, your operators will appreciate the crisp, easy-to-read characters. High resolution is maintained even when switching from an 80 to 132 column mode.

Other features that enhance productivity include 8 programmable function keys with matching screen labels; an English option menu; a detachable keyboard that tilts from 5 to 12 degrees and has tactile feedback; standard character sets; and the list goes on and on.

In the interest of operator productivity, write to Teletype Corporation for more information on the 5410 at: 5555 Touhy Ave., Dept. 3223-H, Skokie, IL 60077. Or call 1 800 323-1229, ext. 111.

**TELETYPE: VALUE SETS US APART.**

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**AT&T**

Teletype Corporation



## COMPUTER INDUSTRY



## SUPERSHORTS

**AM International, Inc.** announced that it has signed a contract with **Decision Data Computer Corp.** for maintenance of AM International's business systems network. Under the terms of the contract, Decision Data will provide on-site maintenance service at AM International locations throughout the U.S.

**Guardmark, Inc.** has introduced a new computer security consulting service. In addition to designing physical security for data processing centers and work areas, Guardmark said it can design and implement control systems and procedures for data flow, from source documents through the computers to protection of output information.

**Sun Microsystems, Inc.** announced a multiyear distribution contract, valued at approximately \$7 million, with the **Lionel Singer Group** of Australia. The Singer Group will form a new company, **Sun Computer Australia**, which will exclusively sell and service Sun computer products throughout Australia.

**Strategic, Inc.** announced that it has established a Japanese subsidiary, **Nippon Strategic**. The subsidiary will enable Strategic to serve the needs of North American and European clients that track Japanese information systems, communications, computer-aided design and engineering and semiconductor developments. Motosuke Mizusawa has been appointed president of Nippon Strategic.

**Seagate Technology, Inc.** has signed **Hamilton/Avnet** to carry Seagate's line of Winchester disk drives. The agreement has an estimated value of \$60 million over a two-year period and calls for Hamilton/Avnet to carry Seagate inventory and provide systems integration support and repair service across North America.

Three public data networks recently certified **Intecom, Inc.'s** integrated business exchange for their X.25 networks. **GTE Telenet Communications Corp., Tymnet, Inc.** and **Uninet, Inc.** X.25 public data networks for domestic and international data communications approved the certification testing, which was recently completed at Intecom's development and manufacturing center in Allen, Texas.

**Verdix Corp.** announced the formation of two product divisions, a system and security products division and a software products division, which the company termed integral and essential to the successful introduction of its major product lines. Verdix named William Post as vice-president of the new system and security products division. Verdix cofounder and executive vice-president, Dr. Donn Milton, will head the new software products division.

**Convergent Technologies, Inc.** announced that it has issued warrants to **Burroughs Corp.** and **NCR Corp.** pursuant to prior agreements. The Burroughs warrants are exercisable in increments after Burroughs has purchased (in addition to purchases under warrants previously granted to Burroughs) \$100 million of Convergent's products and are exercisable in full after the purchase of \$300 million of Convergent's products within a three-year period.

As part of the transaction, Burroughs has committed to purchase \$100 million of Convergent's products during that three-year period. The NCR warrants are exercisable in increments after NCR has purchased \$75 million of Convergent's products and are exercisable in full after purchase of \$125 million in products within a 3½-year period.

The warrants will be accounted for in the same manner as those previously issued by Convergent.

**Scott Instruments Corp.** has been awarded a \$29,080 Phase I grant by the U.S. Department of Education to research a speaker-independent, voice-entry terminal for microcomputers. Upon successful completion of the Phase I grant, Scott will be eligible to apply for \$200,000 to \$400,000 in Phase II product development funds.

The Department of Education award is made under the Small Business Innovation Research program.

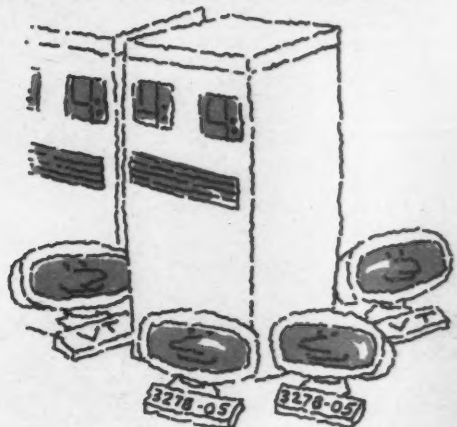
**The Society of Satellite Professionals (SSP)** announced the addition of six new corporations to its growing list of corporate sponsors and patrons.

Five U.S. firms recently joined the SSP: **American Satellite Co., Rockville, Md.; RCA American Communications, Inc., Princeton, N.J.;** and **Hogan and Hartson, Washington, D.C.,** became charter sponsors. **Hughes Television Network, New York,** and **Western Union Telegraph Co., Upper Saddle River, N.J.,** became charter patrons. In addition, **Telespazio SPA, Rome,** became the first international corporate sponsor.

**International Rectifier Corp.** announced that it has filed an answer and counterclaims in an action brought in U.S. District Court by **Sillcom, Inc.** relating to International Rectifier's trademark, **IRF.**

**Zymos Corp. and Intel Corp.** announced they have signed a letter of intent to extend their previously reported technology exchange agreement covering joint development of custom very large-scale integration circuits.

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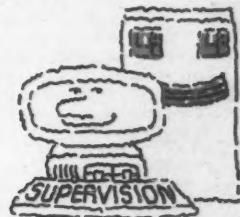
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## COMPUTER INDUSTRY

**ARSINE** from page 93

um arsenide diodes, transistors and monolithic microwave integrated circuits. The company has some 20 reactor furnaces used to process gallium arsenide wafers, one of which uses arsine gas, Bothwell said.

Arsine gas, which contains a combination of hydrogen and arsenic, can lead to a variety of disorders including nerve damage, liver and kidney injuries, skin conditions and gastrointestinal disturbances, according to Dr. Rose H. Goldman, a state occupational health physician, in a July report to M/A-Com. Arsenic has also been associated with the development of liver cancer and skin cancer as a result of long-term exposure, Goldman stated.

According to company officials, during the early morning of June 10, Zemotel was visiting workers on the second floor in the area of the upper epitaxial laboratory. No one saw Zemotel enter the unlocked laboratory, which he was not then authorized to enter. He reportedly unscrewed a panel to get to a tank, unscrewed a cap, turned on a valve and inhaled a lethal dose of gas.

Zemotel then went back to work, the company said, and, at 7 a.m., complained of a headache, numbness and back pain to the company nurse. The nurse reported that his skin was bluish, indicating oxygen deficiency in the blood. Zemotel was taken to the Lahey Clinic in Burlington, where he remained on the critical list until his death 11 days later.

Recommendations in the state report stated:

- Tighter security should be imposed in areas handling highly toxic substances.

- An expanded program of training and instruction on toxic substances as required by the state's Right to Know Law should be started as soon as possible.

- Biological monitoring of workers handling toxic substances should be performed on a regular basis, when feasible.

- Air monitoring in areas where toxic substances are handled should be periodically performed.

- Records of training, instructions, air and biological monitoring should be kept.

M/A-Com's Bothwell characterized the report by saying, "The investigation found no basis to fault M/A-Com in the death of Mr. Zemotel." In line with the recommendations, Bothwell said, the company "has either taken appropriate action or is in the process of doing so."

Specifically, Bothwell said that access to the arsine gas is now restricted by locked doors and card keys issued only to authorized personnel. In addition, TV monitoring of the inside and outside of the building has been stepped up, and a more sophisticated computerized emergency alarm system has been obtained.

To conform with the recommendation that training be expanded, Bothwell said that two industrial hygienists have been hired. "We will be in absolute compliance with the Right to Know Law," Bothwell said. Workers handling toxic substances will be given urine tests quarterly, and more on-line air monitoring equipment has been installed, he said.

Asked if the measures were taken in response to Zemotel's death, Bothwell said, "We have been extremely sensitized as a consequence of this tragic incident."



**Auto-trol Technology Corp.** has announced revenues for the second quarter ended June 30 of \$17.1 million, compared with \$12.8 million the same period a year earlier. Profits were \$1.1 million, or 24 cents per share, compared with a net loss of \$1.3 million, or 37 cents per share, in the corresponding quarter of last year.

**Science Management Corp.** reported third-quarter revenues of \$4.6 million, compared with \$3 million a year earlier, and profits of \$335,000, or 8 cents per share, compared with \$443,000, or 14 cents per share, a

year earlier.

**Sterling Software, Inc.** announced that revenues for the third quarter ended June 30 were \$4.6 million, compared with \$3 million in the comparable period last year. Profits were \$335,000, or 8 cents per share, compared with \$443,000, or 14 cents per share, in the same period one year ago.

**Dataram Corp.** reported a net loss of \$2.2 million, or \$1.10 per share, for the first quarter ended July 31, compared with a net income of \$41,000, or 2 cents per share, last year. Revenues were \$4.3 million, an increase of 17% over \$3.7 million a year earlier.

**Docutel/Olivetti Corp.** reported a net loss of \$9.3 million, or \$1.38 per share, on revenues of \$43 million for

the second quarter ended June 30, compared with a net loss of \$190,000, or 3 cents per share, on revenues of \$58.1 million for the corresponding quarter reported one year earlier.

**Harris Corp.** reported that profits in the fiscal year ended June 30 were \$80.4 million, or \$2.02 per share, compared with \$63.8 million, or \$1.62 per share, in 1983. Revenues were \$2 billion, compared with \$1.8 billion reported for the company a year earlier.

**Perfectdata Corp.** revenues for the first quarter were \$1.2 million, compared with \$1.4 million in the same period last year. Profits were \$2,000, or 0 cents per share, compared with \$106,000, or 5 cents per share, reported for the comparable period one year earlier.





## COMPUTER INDUSTRY

## Test quirks prompt DOD rejection of some TI chips

WASHINGTON, D.C. — The U.S. Department of Defense recently announced it would not accept certain products containing microcircuits made by Texas Instruments, Inc., citing inadequate testing of chip performance.

A Pentagon statement said that Department of Defense quality assurance experts at contractors' plants will not accept products with TI chips "until the impact of the testing irregularities can be evaluated and resolved." The Pentagon instructed contractors using the TI chips to return unused chips to TI for retesting.

The move is part of a government crackdown on semiconductor producers who do not adequately test their

chips to ensure they meet military specifications. In March, National Semiconductor Corp. pleaded guilty to federal fraud charges pertaining to its testing program [CW, March 12].

The Pentagon statement did not accuse TI of any fraud. The irregularities were discovered after a "lengthy technical review" of tests by IBM, which bought some of the TI chips, according to a spokesman for the Defense Logistics Agency.

TI is providing a list of as many as 80 defense contractors who have ordered semiconductors from the company for use in military weapons systems and equipment, the spokesman said.

TI said it has issued a government-

industry data exchange program alert to customers of certain military semiconductor discrete and integrated circuit devices.

The company said it is comparing internal test specifications, printouts of in-house test programs and is developing a list of parameter differences that will serve as tools for assessment of the impact of parameter differences on device applications.

TI further said it has stopped shipping potentially affected devices.

While the potentially affected devices represent only a small portion of its semiconductor billings, TI said it is possible its equipment group could experience a slip in billings from the third and fourth quarters.

## FASB from page 93

ty is, of course, we are dealing in words, and it is not easy to tell how to interpret [the FASB] words."

Another member of the Adapso committee, James Porter, vice-president of Informatics General Corp., said "the major point of departure" between the FASB proposal and the earlier task force proposal was, "Where do you start capitalization?" He said he hopes the proposal can be modified, but said he doubted it would be.

Curt Monash, a software industry analyst with the investment firm of Paine Webber Mitchell Hutchins, Inc., said the FASB proposal "creates the prospect of sanity being brought to software accounting." Presently, Monash said, vendors believe "it is cheaper to buy software than make it," because acquisition costs can be amortized over several years.

Monash said it is difficult to estimate the impact on annual financial results, but he is informing clients that the FASB proposal should add 10% to the earnings per share figures of leading software firms. The impact could boost the earnings per share figures by as much as 50%, he said.

There will likely be no impact on users, Monash said. "This is recognizing that the companies are building assets ... it is just a paper change and will not impact the companies' cash flow."

Porter said the FASB proposal "finally recognizes the fact that software is an asset, it has value." More important, he noted, "It puts the software industry on an equal footing with other industries in the capital market."

While the Adapso committee has not met since the FASB issued its proposal, the FASB does allow a 90-day comment period before deciding whether to adopt the proposal, schedule a public hearing or refer it back to its staff for work, Ray said.

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SESSION TIME	WED., OCTOBER 3	THURS., OCTOBER 4	FRI., OCTOBER 5
12:00-1:00	IBM KEYNOTE PRESENTATION: Software in the 80s	Outlook for Integrated Software Understanding Local Area Networks* Data Base Management Software Update†	How to Get Service & Support You Need What's Available in Banking Software* How to Succeed in Business Graphics†
1:00-2:00	The Outlook for Portables Getting Started With Your PC* Telecommunications and Beyond†	What to Expect From Networks How to Choose a Printer* Integrated Software Applications†	Compatibles Update Software for Oil Industry* Everything You Wanted to Know About Interface Boards and Peripherals†
2:00-3:00	Overcoming Executive Computerphobia The Outrageous Consumer's Guide to Word Processors* Networking Architecture†	PC Security Software for CPAs* Linking PCs to Large Host Networks†	INDUSTRY/USER DISCUSSION (2:00-4:30)
3:00-5:00	Communications on the PC: The Bridge to Productivity (Session followed by ½ hour Roundtable Discussion)	Evaluating Software Packages: Try Before You Buy (Session followed by ½ hour Roundtable Discussion)	*INTRODUCTORY †ADVANCED

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**PC WORLD  
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## BLITZ from page 93

grows on the peachtree." Peachtree, by the way, has decided that if it cannot establish its product visually, it can do so in a more odoriferous manner. The company is printing promotional materials that carry more than a gloss; they come complete with the fragrance of peaches. Can scratch-and-sniff computers be far behind?

Lest you think just the newer guys on the block are attempting to carve out a mass media audience, be informed that some of the oldest are going the same way.

For instance, NCR Corp. has actor Dom DeLuise showing us a veiled future product of which he can only reveal that it is smaller than himself.

With plenty of money rolling into the computer business these days (despite the attention focused on the few failures), it is only natural that the marketing types try to spread it around. And with computers becoming increasingly familiar to society in general, it is only natural that the television be tapped. One can only wish these commercials showed a little of the inventiveness that went into producing the actual products.



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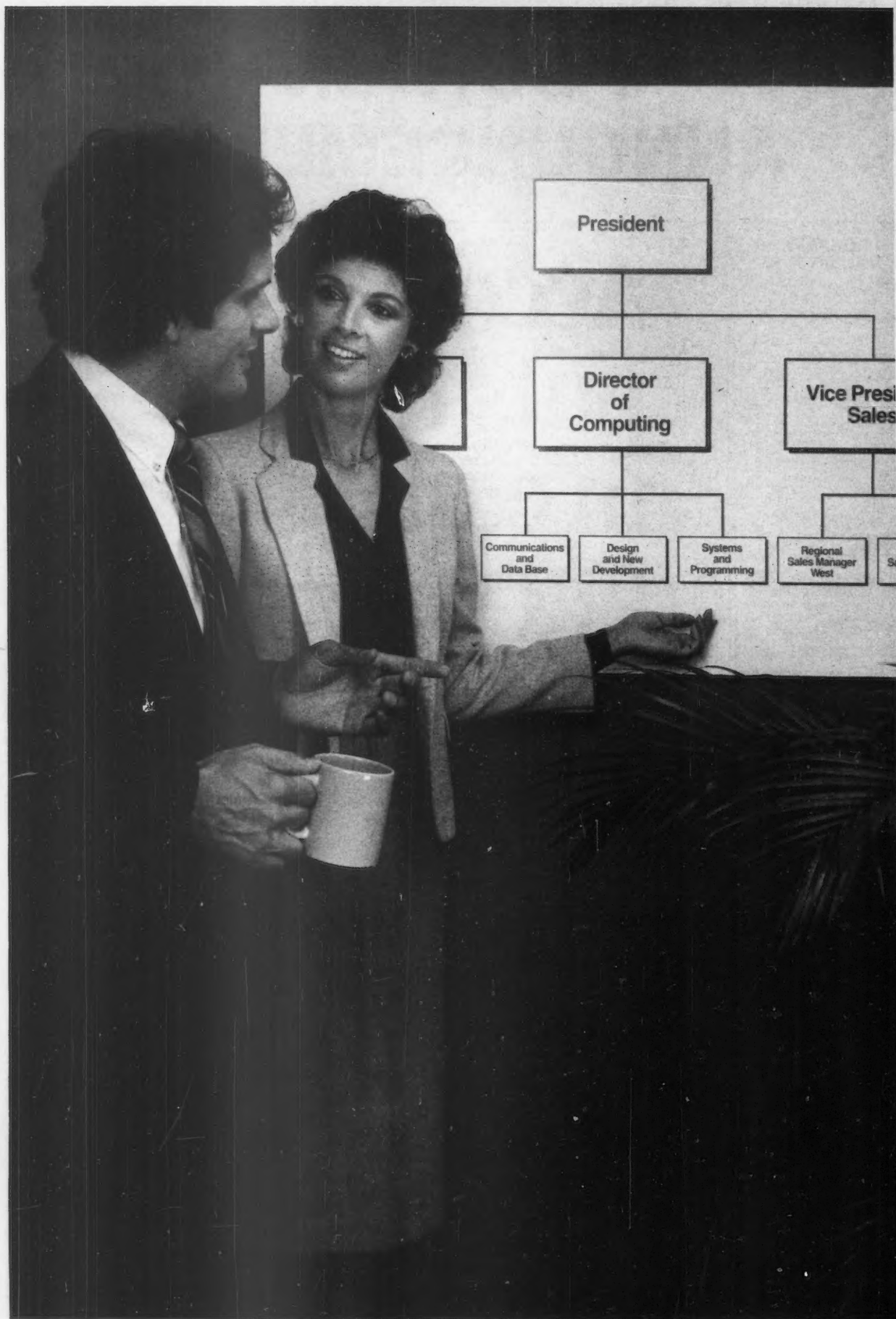
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### Applications Programming \$23,000 – \$54,000

Those with two or more years' experience in applications programming will have an opportunity to learn new skills while ensuring maximum compensation. Positions exist in environments ranging from the largest scale mainframes through mini and microcomputer user, consulting and vendor firms.

Positions are available using a variety of languages including COBOL, PL/I, Assembly, RPGII, PASCAL, "C" or BASIC; operating systems like OS/MVS, VM/DOS/VSE, UNIX, AOS, and data base and data communications like IMS, CICS, INFOS, TOTAL, IDMS, ADABAS, System 2000, ADDS-0 and more. Significant opportunities exist for those with solid programming backgrounds to move into systems development, software, EDP auditing or systems evaluation.

### Software Development/ Software Engineering \$28,000 – \$60,000

Individuals with two or more years of software design and development or software engineering experience will be able to gain experience in and develop some or all of the following: operating systems, capacity planning and performance enhancement tools (OMEGAMON, MEAGAMON), compilers (C, PASCAL, ADA), I/O and device handlers and program generation tools. This development work will take place on a variety of systems including IBM 3083's, VAX 11/780's, Tandem Non-Stop, and variety of other mini and micro systems (Motorola 68000, Intel 8080's).

Many of the companies participating in the Conference offer formal training and experience in leading-edge technology as well as day-to-day contact with some of the top technical profes-

sionals in the country. A number of opportunities with new venture companies offer exceptional growth and equity potential.

### Data Base/Data Communications \$25,000 – \$55,000

Many openings exist for individuals with backgrounds in database and/or data communications. Exposure to a variety of technologies is possible, including: IMS DB/DC, ADABAS, IDMS, TOTAL, FOCUS, CICS, ENVIRON/I, TCAM/NCP, SDLC, SNA, X.25 and other database and/or data communications software.

Companies participating in the Conference include major computer and software manufacturers, Fortune 500 companies, prestigious consulting firms as well as many emerging high technology firms.

### Systems Programming \$24,000 – \$55,000

Opportunities provided by client firms that are participating in the Conference are broad and unique. Those with at least one year of systems programming experience will be able to strengthen their skills as well as gain knowledge of some or all of the following: UNIX, CPM, CICS, IMS, OS/VS, DOS/VS, ADABAS, DL/I, modems, duplex lines, switches, and more in both mainframe and mini or micro environments. Assignments range from program development and enhancement to systems support.

### EDP Auditing \$25,000 – \$58,000

Exploding opportunities exist in EDP auditing. There are many openings for those professionals who have a good technical background in programming or design plus exposure to accounting

applications. Large firms are expanding their EDP auditing departments and are providing specific training in auditing for Programmer Analysts—particularly those with over two years experience.

### Technical Writing \$21,000 – \$38,000

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### Systems Development/ Management Consulting \$31,000 – \$78,000


A broad variety of openings exist for persons with systems design and development backgrounds ranging from systems analysis to senior project management and/or management

consulting. Many leading-edge communications and data base-oriented information systems projects are being planned by Conference client firms. In addition, a number of small to intermediate size firms are just beginning to make their initial thrusts into computing—especially in mini/micro areas—and need new applications development expertise. Several nationally-respected management consulting firms will also be represented for those persons who are interested in a variety of new development assignments with high visibility to corporate management.

### Sales, Marketing and Technical Marketing Support \$23,000 – \$108,000

Those professionals who attend the Conference will learn about new opportunities in computer sales, marketing and marketing support. Many alternatives exist in various product areas including mainframes, mini/micro-computer technology, terminal systems, time-sharing, facilities management, proprietary software packages, OEM's, consulting and more. Many firms are just now entering new markets and will provide exceptional career and compensation growth potential—as well as equity participation.

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## POSITION ANNOUNCEMENTS

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## RCA Systems Development

RCA Service Company is under contract to develop and maintain state-of-the-art real-time data acquisition, tracking and interactive display systems driven by Gould/SEL 32/87 and INTEL 8086 computers.

The Systems Development Group now has openings located at the Development Site in Newport, Rhode Island and the Operations Site on a remote island in the Bahamas.

### Sr. Systems Analyst

The successful candidate will participate as a member of the senior development staff engaged in systems planning, requirements definition/specification, and algorithm development. Must be able to produce written requirements specifications, coordinate subsequent technical feasibility studies and produce justification studies as necessary. The candidate will lead quality assurance efforts including code/standards reviews, in-depth system output evaluation and data evaluation and analysis. Minimum qualifications include a BS (Masters Degree preferred) in a scientific discipline and 5 to 10 years experience in a related field. (Newport position, contact E.A. Singer).

### Systems/Diagnostic Programmer

Experience on SEL Concept 32 systems under MPX 2.1-A and/or MPX 3.2 as well as troubleshooting of systems level hardware/software problems and operating systems maintenance. Requires experience in Gould/SEL Assembly language, diagnostics and MPX internals. Degree preferred and FORTRAN applications are a plus. (Bahamas position, contact D.V. Carney).

### Software Engineers-Real Time Programmers

Radar and acoustic tracking systems software development, primarily in FORTRAN 77. Assignments include real-time scientific data processing programs, alphanumeric CRT displays, CRT and large screen graphics, and operating system problem diagnosis. Candidates will participate in detailed software design definition and be responsible for complete documentation.

Junior positions require BSCS and 0 to 3 years relevant experience. MSCS and 3 to 5 years experience preferred for Sr. positions. Formal training and/or experience in Raster Graphics highly desirable. (Newport positions, contact D.V. Carney).

### Systems/Diagnostic Programmer

Development/Enhancement of I/O handlers system and system services. Experience on SEL Concept 32 systems under MPX 2.1-A and/or MPX 3.2 as well as troubleshooting of systems level hardware/software problems and operating systems maintenance. Requires experience in Gould/SEL Assembly language, diagnostics and MPX internals. Degree preferred and FORTRAN applications are a plus. (Bahamas and Newport positions, contact D.V. Carney).

### Sr. Systems Engineer

To be responsible for a broad range of engineering functions including project engineer, systems configuration requirements definition, equipment integration, hardware/software trouble analysis, and some digital design. Position requires either a BSEE degree with 5+ years of experience or an MSEE degree with equivalent experience. Familiarity with INTEL 8086 and/or GOULD/SEL computers is a plus. (Newport position, contact T.W. Dukes).

This project offers an opportunity to grow with the technology utilizing contemporary and frequently innovative methodologies as well as small company atmosphere with big company benefits. Assignments in the Bahamas receive bonus pay, attractive tax advantages and subsidized or free housing and meals. All positions require US citizenship and occasional travel. Qualified applicants are encouraged to mail resume including salary requirements to:

**RCA Service Company**  
Department 261866  
Aquidneck Industrial Park  
Middletown, RI 02840

Equal Opportunity Employer



## TELE COMM

Major CT corp. expanding internal support staff. Exp. w/networking, PBX, VOICE, diagnostic techniques qualifies for state-of-the-art leader in its field. Salaries \$32 to \$43,000.

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Personnel Consultants

### SYSTEMS ANALYST

40 hours per week, 9 am to 5 pm. Salary: \$30,000 per year. Requirements: Master of Science in Computer Science; 1 year experience in the position or 2 years experience as a database administrator; thorough knowledge in the understanding and application of the Integrated Database Management System software. Duties: analyze database structures in relation to the problem to be solved, modifying computer applications where necessary, plan installation of new system utilizing knowledge of data processing principles and equipment including COBOL programming language, ADS on-line operating system and the Integrated Database Management System software package. Send resume to: ILLINOIS JOB SERVICE, 910 South Michigan Ave.-3rd Floor, Chicago, IL 60605, Allen Cert. Unit, Ref. No. 169-167-J. AN EMPLOYER PAID AD.

### Personal computer users:

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Computer Listings of Employment Opportunities

## CONSULTANTS

Excellent earnings, expense account, exciting assignments for applicants who join outstanding internat. software consulting firm. Req. COBOL and/or PL-1; prefer CICS & IMS. Apps & sys. programming. Must have min. 2 yrs. exp. & be willing to relocate. Enhance career growth & ind. knowl. via frequent assignment changes. To \$41,000.

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(716) 842-0801  
Personnel Agency

### M.S.

### SYSTEM SUPPORT SPECIALIST TELECOMMUNICATIONS

St. Joseph Mercy Hospital is a progressive 312-bed acute care facility located in North Central Iowa. We are currently seeking an individual for a position within our Management Information Systems Department as a Systems Support Specialist in the area of telecommunications.

This individual will be responsible for the installation and on-going management/maintenance, and enhancement of the various order communications, office automation, local area network, and information center systems.

The successful candidate will possess an M.B.A. or masters level computer science degree, or a bachelors degree in the same with 3 years of job related experience preferably in the health care environment.

This is an excellent opportunity with a very competitive salary and full benefit package. Interested applicants please send a personal resume and salary requirements in confidence to:

Personnel  
St. Joseph Mercy Hospital  
84 Beaumont Drive  
Mason City, Iowa 50401  
An Equal Opportunity Employer

### MANAGER TECHNICAL SUPPORT

Directs requirement definition and planning functions to include development of functional specifications for a growth organization in a state-of-the-art environment. Coordinates capacity planning and implementation of computer equipment and software. Develops RFP's and monitors contractual performance. Supervises technical assistance to development planning and assists in post implementation reviews. Challenging position for dynamic progressive individual requires degree plus 5 years experience with responsible experience as substitute for degree. Salary in mid-30's with an excellent benefits package. Resume, transcript and salary requirements to:

Southwest Florida Water  
Management District  
2379 Broad Street  
Brooksville, FL 33512

EOE M/F

### TECHNICAL SUPPORT SUPERVISOR

Highly technical and administrative work directing the design and maintenance of specialized computer software used in the operating system. Technical support and liaison is provided in the functional areas of application systems and programming, hardware utilization, systems programming and data base expansion and control. Minimum qualifications: bachelors degree in mathematics, data processing, accounting, or engineering and 5 years systems programming experience, which has included supervisory training or experience; or equal training and experience. Salary range: \$26,977 - \$40,222. Applicants are normally hired at minimum. Contact by 10/1/84.

Apply daily in the Personnel Department, Pinellas County Courthouse, 315 Court Street, Clearwater, Fla. 33516; Tel. (1-813)-462-3387. Apply daily also in Room 150, County Building, 150 5th Street North, St. Petersburg, Fla. 33701; Tel. (1-813)-825-1680. An Equal Opportunity Employer.

## Join Computer Sciences Corporation's Energy Research Division

Computer Sciences Corporation, the world's largest information sciences company, seeks technical representatives to join the Energy Research Division's staff in a dynamic-service-oriented environment in Las Vegas, Nevada.

As a member of our staff, you will help provide systems engineering, systems programming, and consultation support to the U.S. Dept. of Energy's Nevada Operations Office in conjunction with the operation of a large data center. You will initially be involved in the acquisition, installation, acceptance testing, and conversion to a new large-scale business computer system. You will also be involved in system performance monitoring and capacity planning, business application and system software acquisition and implementation, office automation planning and implementation, system software maintenance, data center user consultation, and user training.

Positions available in our Las Vegas office are:

### COMPUTER SCIENTIST

Requires a BS/BA and at least 8 years experience, or an MS and a minimum of 5 years experience, or a demonstrated ability to carry out the required responsibilities. This position requires a strong background in systems engineering. Previous experience in the areas of capacity management and data center system and user support is also highly desirable.

### SENIOR MEMBER OF TECHNICAL STAFF

Requires a BS/BA plus 6 years experience, or an MS and 4 years experience, or a demonstrated ability to carry out the required responsibilities. This position requires a strong background in business application systems design and programming, data base management systems, and transaction processing. Previous experience in the areas of systems engineering and data center system and user support is also highly desirable.

U.S. Citizenship required for the above positions.

CSC offers competitive salaries and an excellent benefit program. For consideration, call or send your resume to: Ms. Susan Knorr, (702) 295-1331.

**CSC**

COMPUTER SCIENCES CORPORATION

ENERGY RESEARCH DIVISION

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## COMPUTER SPECIALISTS



KANSAS CITY, MISSOURI

USDA is looking for project-oriented professionals for a one-year period to develop a nationwide distributed network in a large data base, on-line computer facility and a multi-programming time sharing environment.

Successful candidates will have the following credentials:

- Knowledge of 4th generation computer hardware and software
- Ability to program in COBOL
- Knowledge of modular computer design and programming techniques
- Knowledge of mini-computers
- Knowledge of time-sharing systems
- Knowledge of application system testing
- Knowledge of application programming in a data base environment
- Knowledge of telecommunications, protocols, and packet switching

WE OFFER: SALARY RANGE \$25,489 - \$30,549

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Patty Brightwell (USDA) (816) 926-6647.

FEDERAL APPLICATIONS MUST BE COMPLETED AND POSTMARKED BY 10/8/84 TO:

Office of Personnel Management  
601 East 12th Street  
Kansas City, MO 64106

PAYMENT OF RELOCATION EXPENSES  
IS NOT AUTHORIZED UNDER THIS ANNOUNCEMENT

## EMPLOYMENT SERVICE FOR PROGRAMMERS AND ANALYSTS

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and Through Affiliated Agencies

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Cherry Hill, New Jersey 08002  
(609) 667-4488

RSVP SERVICES, Dept. C  
Suite 211, Dublin Hall  
1777 Walton Rd., Blue Bell, PA 19422  
(215) 629-0595

From outside New Jersey, call toll-free 800-222-0153

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Employment Agents for Computer Professionals



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DATA PROCESSING

# WHERE TECHNOLOGIES EMERGE

The resources for technological and career emergence await you at Northrop Advanced Systems Division.



## Important contributions are within your reach.

Northrop Advanced Systems Division, dedicated to advancing technologies and resolving complex challenges to America's defense, has created immediate opportunities within our Computer Systems Department.

Here, you will join our progressive team of talented computer professionals and make significant contributions in support of our Division's vital technical and business organizations.

### Business Systems Programmers/Analysts

Analyze and develop systems design solutions to Manufacturing, Engineering, and Financial business application problems. Interact with both data processing and user personnel while working with the latest IBM hardware, implementing these systems within an integrated database architecture. IMS with emphasis on DB/DC, COBOL, and related software experience required. DYL 280, MARK V and any fourth generation language experience desired.

### Scientific Programmers

Requires experience with real-time control applications in a manufacturing environment or similar, DEC, Hewlett-Packard, IBM Series 1 hardware, and programming in FORTRAN, PL/I and Assembly languages. Should have skills in building communication between IBM hosts and above hardware, minicomputer and programmable controllers including "handshaking" capabilities. Data reduction and manipulation skills and knowledge of database techniques preferred.

### Database Specialists

Senior-level positions involving IMS DB/DC database systems development for key technical and business organizations within the Division. Will perform data-related activities to develop an integrated database environment. Requires extensive experience with on-line and batch IMS DB/DC database systems. Additional skills and experience in database design methodology as well as logical data analysis and modeling is highly desirable.

### IMS Systems Programmers

Involves development, design and use of the IMS on-line system. Will also troubleshoot and tune an IBM (DB/DC) system. Knowledge of IMS (DB/DC) installation and maintenance techniques required.

### Performance Specialists

Involves Performance Measurement and Tuning of large multi-system complexes. You will utilize such sophisticated tools as the MICS Performance Data Base Manager, SAS and Telegraph for reporting, Omegamon and RMF for monitoring, and Best 1 and CMF for modeling. Requires experience in Measurement and Analysis, featuring TSO and other interactive systems using RMF and SMF Data. Knowledge of MVS/XA, IMS or CADAM is desirable.

### Data Processing Equipment Configuration Specialists

Responsibilities include equipment evaluation, acquisition recommendations, configuration design, and installation design for all types of central site IBM data processing equipment. Will also monitor site facilities planning and equipment, and facilities inventory tracking.

### Network Design Specialists

Direct the activities of a team of highly skilled communications analysts in designing and maintaining network architectures in a local and remote environment. Leadership skills, along with a solid background in ASYNC, BISYNC and SNA/SDLC protocol, and local area topology, required. A good understanding of common carrier facilities, as well as satellite communications experience, desirable. An advanced degree is preferred.

### Sr. Communications Analyst

Requires 5+ years' experience in designing and installing network architectures in a local and remote environment. Must have demonstrated experience with local topologies, common carrier links (terrestrial and satellite), ASYNC, BISYNC, SNA/SDLC protocols, IBM communications and cluster controllers, multiplexing, cross domain, and minicomputer networking (peer style or inter-connection). A BS degree is preferred.

### Network Planner/Scheduler

Requires experience in one or more automated project management systems (Artemis, CIPREC, PMSIV, EZPERT, VISION, Nichols, etc.) to develop dependency networks (task and resource), charts and progress reports to control and report status of computer equipment installations. Experience in a Network services organization and college degree preferred.

### Programming Quality Assurance

Requires computer systems professionals with experience in project management and excellent interpersonal skills to work on our programming QA staff. Must be familiar with the conducting of life cycle phase reviews, evaluation of software products, and the development of internal computer systems standards. A BS degree and significant project management experience, including the above-mentioned responsibilities, required.

Please send your resume to: Dave Coffey.

### Operations Specialist

As our Operations Specialist, you will coordinate data control functions to develop training and personnel development plans related to JCL, in-house software, TSO, and purchased software packages. You will also initiate communication and coordinate scheduling with customers and systems administrators, as well as perform job analysis. At least five years' experience in data control functions, including job setup, verification control, quality assurance and distribution, required.

For this position ONLY, please send your resume to: Barbara Nettles.

The involvement, scope and dimension of these career pursuits are further heightened through some of the most tangible, comprehensive personal benefit arrangements available. Please send your resume to the appropriate contact person at: Computer Systems Employment Office, Dept. CW 9-17, P.O. Box 1138, Pico Rivera, CA 90660-9977.

Proof of U.S. Citizenship Required. Northrop is an Equal Opportunity Employer M/F/H/V.

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# NORTHROP

Advanced Systems Division  
Aircraft Group



## POSITION ANNOUNCEMENTS

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## RAYTHEON SERVICE COMPANY

The Mid-Atlantic Systems Facility of Raytheon Service Company, the engineering services arm of Fortune-100 Raytheon, has immediate openings in the following areas:

### Software Engineers

Candidates for these openings should have a minimum of a BS degree with 2 years experience in military software development. Familiarity with one or more of the following languages is essential: CMS-2, Ada, PASCAL, C, JOVIAL, FORTRAN. In addition, experience in the following hardware is helpful: ANUYK-7120/44, VAX 11/780, M68000.

### Instructors

Openings exist for individuals with a technical degree, preferably a Masters, with at least 2 years experience in real-time software development. The ideal candidate will be familiar with one or more standard military languages: CMS-2, FORTRAN, Ada, JOVIAL. Classroom or instructional experience is helpful. Some travel may be required.

### Quality Assurance/Configuration Management

These openings require experience in developing a QC/CM program for a diverse software organization. The ideal candidate should possess a minimum of a BS degree with 2 years experience in Quality Assurance and knowledge and experience in DOD-STD-1679. Initial efforts will be to develop the overall procedures, define and coordinate automated tools.

### Marketing Manager

Requires experience in software engineering and demonstrated record in direct marketing of technical services to government procurement agencies, especially military. BS preferred.

The above openings are available at various locations including:

Mt. Laurel, NJ  
Boston, MA  
Dahlgren, VA  
Gaithersburg, MD

Newport, RI  
Pascagoula, MS  
Pt. Hueneme, CA  
Italy, Japan, Hawaii

Raytheon Service Company offers competitive salaries and an excellent company-paid benefits package. If you feel you qualify for one of these challenging positions, please send your resume in confidence to: K.A. Rieger, Raytheon Service Company, Mid-Atlantic Systems Facility, P.O. Box 851, Dept. 851, Dept. CW917, Moorestown, NJ 08057.



RAYTHEON COMPANY  
RAYTHEON SERVICE COMPANY

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## COMPUTER PROFESSIONALS

### Meet The Challenges at Our Advanced Technology R&D Center

Babcock & Wilcox, one of the nation's leaders in energy-related technology, seeks solidly experienced computer professionals to fill immediate openings in its Research and Development Division.

#### BUSINESS ANALYST

Responsible for defining and justifying the hardware and software business computer needs of the Research Center. Will assist in the configuration, implementation, and lead system support for a new business computer. 5-10 years of applicable work experience, and a B.S. is required.

#### GROUP SUPERVISOR

Responsible for the first-line supervision of business systems analysts and programmers, office automation specialists, and personal computer specialists. A B.S. in computer science and 5 years of applicable work experience is required.

#### COMMUNICATION SYSTEMS ENGINEER

Provides planning, analysis and support in our data communications environment; makes hardware and software evaluations and recommendations for our voice and data communication systems. 3-5 years of applicable work experience, and a B.S. in electrical engineering or computer science is required.

#### MATHEMATICIAN

Duties will include mathematical modeling and simulation, numerical analysis, and scientific programming in support of engineers working in the areas of structural analysis, fluid flow, and other technical fields. A PhD in a related field with emphasis in applied math is required, along with 3-5 years of applicable work experience.

Salary and benefits are excellent, as is the potential for career development. For confidential consideration, please send resume to James Craft, Employment Coordinator, Alliance Research Center, Babcock & Wilcox, 1562 Beeson Street, Alliance, Ohio 44601.

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**Babcock & Wilcox**  
Research & Development  
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#### Software Systems Analyst

Senior Software Systems Analyst  
Applications are being accepted for Software Systems Analyst and Senior Software Systems Analyst positions at the University of Nevada. These positions report to the A.S. of Support Services. Responsibilities include: under supervision, evaluate, install, modify, test, document, develop and maintain computer software on a wide range of micro, mini, and mainframe computers. Primary responsibilities will be in support of operating systems in data communications software. One position will support CDC software and the other will support Burroughs software. Requires a minimum of a Bachelors degree, good communications skills both oral and written, two years experience in data processing with one year in computer systems software analysis and programming, in-depth knowledge of one or more computer languages, and ability to work with diverse individuals in a tactful, productive manner. Additional minimum requirements for senior position: five years experience in data processing with three years in computer systems software analysis and programming, and in-depth knowledge of two or more computer languages. Salary: \$16,000 to \$33,700 depending upon position, skills, and experience. Application deadline: October 17, 1984. Send letter of application, resume, and the name, address, and telephone number of at least three professional references to:

Paul Franklin, UNS Computing Center,  
University Of Nevada,  
Reno, Nevada 89557-0023.

The University Of Nevada system is an Equal Opportunity Affirmative Action Employer.

#### EXPERIENCED SYSTEMS PROGRAMMERS, ANALYSTS AND PROGRAMMER ANALYSTS FOR SUNBELT LOCATIONS

Job dissatisfaction, complacency, and frustration are the biggest obstacles to overcome to achieve one's career goals. Everyday new career opportunities pass us by because we are unaware of their existence. Let us keep you abreast of what your true value is in the market place. Absolutely no obligations, please call or write Keith Reichle, CPC, Data Processing Specialist.

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OF CHARLOTTE, INC.  
6401 Carmel Road, Suite 107  
Charlotte, North Carolina 28226  
800-438-2012  
(NC Call)  
(704) 542-0312



Columbia University

### Director of Academic Computing Center for Computing Activities

Columbia University is seeking a Director of Academic Computing who will provide leadership to the development of innovative computer and communications systems for instruction and research. The University has made a major commitment to the use of improved information systems to support scholarly activities and expects this commitment to expand significantly in the coming years. The University regards as especially important the integration of the more traditional forms of information, computation and communications with their newer forms and there is very close cooperation between the University's libraries, communications and computing activities. Working closely with the Deans and Faculty, the Director will be expected to foster this cooperative approach.

The Director will have direct management responsibility for the Academic User Services and Academic Software Systems Groups. These support the University's central instructional and research computing facility which includes 2 IBM 4341's and 4 DEC 2060's, an IBM Mass Storage System, extensive peripherals and a large network of terminals and microcomputers. Also reporting to the Director will be a Development Group whose responsibilities include a major sponsored microcomputer cluster project.

Candidates must have demonstrated imagination, communications and interpersonal skills, flexibility and technical ability in previous assignments. Extensive experience with the use of all sizes of computers is expected and it is highly desirable that much of this has been in a multi-discipline academic or industrial research environment. It is hoped that the successful candidate will also be eligible for an adjunct teaching position in one of the schools of the University. This normally requires a doctorate in the appropriate discipline.

The salary of this position is competitive and the University offers a wide range of health, tuition and retirement benefits. Housing assistance may also be available.

Applications and inquiries should be addressed to Dr. Bruce Gilchrist, Director of Computing Activities and Chairman of the Search Committee, Columbia University, 612 West 115th Street, New York, NY 10025. Our review of applications will start on October 16th with the aim of filling the position as soon as possible thereafter.

We take affirmative action toward equal opportunity.

data processing

## SYSTEMS ANALYST

Expansion of our Data Processing Department has created an opportunity for an experienced Systems Analyst. Position is responsible for analysis and design of systems, analyzing results of system testing, and performing cost-benefit analysis studies. Individual will also serve as a project technical lead, with initial assignment to a major project in our Engineering Department. Requires an ATA degree in Computer Science and 6 years of progressively more responsible systems analysis experience in a database environment.

Qualified individuals will have a thorough knowledge of system analysis, system design, cost-benefit analysis, and advanced project management techniques. Individual should have strong communication and personal interaction skills. Three years of programming experience and experience in an electric utility engineering environment is highly desired.

We are the nation's twelfth largest public electric utility, located 35 miles north of Seattle. If qualified, submit resume to: Craig Lawson, Staffing Specialist, Snohomish County P.U.D., P.O. Box 1107, Everett, WA 98206.

Equal opportunity/affirmative action employer.

SNOHOMISH COUNTY



**DATA PROCESSING CONSULTANT:** B.S. in Math/Computer Science and 2 years experience in IBM's CICS software package, TSO, Total, VSAM, Parvalet, OC/MVS, Assembler for systems analysis, programming, debugging, documentation and feasibility studies required by clients of consulting firm in Toledo, Ohio with clients throughout U.S. High degree of technical competency and history of software development. \$32,000/annum, 40 hours week, resumes only; Ohio Bureau of Employment Services, 724 Monroe St., Toledo, Ohio 43624; Clearance Rep. CH0236389

#### SENIOR PROGRAMMER/ANALYST

12-month position at University level. Duties include: supervising lower grade programmer/analysts; analyzing programs and selecting electronic data processing to management methods and functions; planning and preparing technical reports, system documents and instructional manuals related to the capabilities of the PDP 11/70 and PDP 11/70 systems. Qualifications: Master's Degree in Computer Science or related field, with a minimum of 2 years as a programmer. Applicants must have a strong background in Basic Plus programming and experience with POSE DMS. Salary: \$30,000. Send letter of application, resume and supporting credentials to: Louisiana Office of Employment Services, 1102 East George Avenue, Ruston, LA 71270. (318) 255-0098. (Job Order #416831). An Equal Employment Opportunity Employer.

POSITION ANNOUNCEMENTS

### MANAGER OF TELECOMM. TRAINING

Leading mini vendor seeks IBM telecomm. guru to train SE's and sales force on IBM technology. Must know VTAM, SNA, NCP, SDLC and other telecomm. tools. New position with opp'ty. for you to make a major impact on firm's sales and your career. \$55,000.

### FOCUS SYS. ANALYST

One of the area's premier banks has an exciting opp'ty. for you to develop new sys. for user depts. IBM OS/MVS/VM/CMS, FOCUS, LOTUS, PC environ. Manage people & proj's. in a dynamic, progressive shop. \$32,000.

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100 Summer Street  
Boston, MA 02110  
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Personnel Consultants

## Scientific & Engineering Associate I

We seek a competent electronic technician with the ability to diagnose and repair down to the component level. Will work in conjunction w/ various scientists designing, developing and maintaining a variety of computer systems, communications hardware and specialized I/O devices.

Must have several years experience with digital logic and computer systems. Knowledge of local area network systems essential. Exp. w/ telecommunications or CATV systems highly desirable.

Please send application/resume to:  
Jose Becerra, #42045  
Personnel/CID Position  
Stanford, CA 94305

## Stanford University

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### Pima County Government Immediate Openings EDP Technical Support Specialist

(1451)...to \$14.11/hour. A bachelors degree from an accredited college or university with a major in Computer Science, Management Information Systems, or a closely related field and 4 years of experience in Computer Programming and Systems Analysis and Design, 2 years of which involved machine or assembly language coding and software development or an equivalent combination of training and experience. Knowledge of VM, CICS and Database preferred. Closes 5pm October 5, 1984. Complete class specifications and applications are available in the Personnel Department.

Pima County Government  
Personnel Department  
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Tucson, AZ 85701

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POSITION ANNOUNCEMENTS

## Product Planning Professionals Can You Take The Heat?

The Hottest Product Planning Opportunities are with Gould's Firebreathing Team in Florida.

The Firebreathers from GOULD blast the competition into oblivion. Do you feel up to the challenge of working with systems that scream through benchmarks 4 to 10 times faster than the VAX\* 11/780? Are you up to the task of taking the most powerful superminis available to yet greater heights?

Gould Inc., Computer Systems Division — the pioneer in the design, development, and marketing of 32-bit super minicomputers for the real-time applications and UNIX\*\* worlds — is intent on soaring beyond the imagination of the traditional minicomputer professional. To forward thinking professionals in the following areas, Gould is offering opportunities for outstanding career achievement.

As Product Planners at our Headquarters in Ft. Lauderdale, Florida, the selected candidates will be responsible for market analysis, product planning, preparation of Business Plans for corporate-level review, and implementation of marketing and sales support plans.

### Product Planners — UNIX\*\* Systems

Several opportunities are available in our fast-paced UNIX\*\* planning and marketing environment. We require individuals who have experience in UNIX\*\* systems including communications, multiprocessor operating systems, and UNIX\*\* based applications software.

### Product Planners — Systems Software

Responsible for requirement definition, development and commercialization of systems software. Requires the ability to interface productively with sales and engineering development organizations. A successful track record in the development and/or management of systems software is essential.

### Product Planners — Applications Software

Responsible for determining and developing application products in keeping with marketing and sales organization requirements. We'll rely on your strong ability to interface effectively with departments within Gould and outside organizations in procuring applications software, including the definition of terms and conditions, and integrating new products into the product line. Your experience should reflect accomplishment in the development and/or marketing of a wide range of scientific and engineering application software.

### Product Planners — Peripherals

Responsible for defining and initiating new peripheral products based upon thorough knowledge of the industry, understanding of present and future peripheral technology, and upon requirements developed with the marketing/sales organization, and the management of those products from inception to end-of-life cycle. A successful track record in the architectural, development, and/or marketing of peripheral subsystems is a must.

POSITION ANNOUNCEMENTS

### Product Planners — Languages

Will assume responsibility for the definition of language systems and management of products using those systems from development or acquisition through the entire product life cycle. Requires a confident ability to interface productively with sales and development organizations. Knowledge of language, systems fundamentals, and a grasp of their marketing significance is essential. Of particular interest are candidates with development and/or marketing experience with the ADA\*\*\* environment.

### Product Planners — Communications

Will assume the responsibility of defining product requirements in the area of data communications products and systems. The successful candidate will possess a proven capability and demonstrate knowledge in all aspects of asynchronous and synchronous communications including industry and international communications standards and concepts. Knowledge of the OSI model is key to success in this area. Knowledge of LAN architecture is highly desirable.

### Product Planners — Processors

Responsible for defining and initiating new processor products based upon keen knowledge and understanding of present and future processor technology, and upon requirements developed with the marketing/sales organization. A successful track record in the architectural, development and/or marketing of processor products is a must.

### Product Planners — Diagnostic Systems

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Requires a college degree in an appropriate technical specialty, combined with 3-7 years of software applications engineering and user level experience with understanding and establishing data bases. Knowledge of major operating systems is desirable. VMS, UNIX\*\*, IBM OS, Primos, etc. Thorough knowledge of FORTRAN required; "C" and COBOL are desirable. Familiarity with Gould computer architecture and VAX\* architecture is an asset.

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\* VAX is a trademark of Digital Equipment Corporation  
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## DATA PROCESSING PROFESSIONALS

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This position will install and maintain communications control, monitor and support programs. Will monitor and tune communications performance and maintain program libraries. Will evaluate new communications system software and serve as a technical consultant. May direct work of subordinate systems programmers. Requires 2-4 years' recent experience as a Systems Programmer with capability of maintaining VTAM R 3 and NCP, including generation, maintenance, problem resolution and tuning. Must be proficient in using SMP4, TSO, ALC, and have experience interfacing with a Network Operations staff to coordinate maintenance of VTAM and NCP tables. Experience in CICS 1.5 or 1.6.1, NCCF, NPDA, MSNF, NPA and other Network Software desirable.

### Systems Programmer II or III

Responsibilities will be similar to above position. Requirements include 2-4 years' recent experience as a Systems Programmer with capability of maintaining a CICS 1.5 or 1.6.1 system including generation, maintenance, problem resolution and tuning. Must have experience as a COBOL CICS applications programmer and proficiency in using SMP 4, TSO and ALC. Experience with Network Operations, VTAM, and NCP desirable.

### Programmer Analyst

Will develop program specifications, along with key user departments, code, test and install enhancements to our existing application systems. Prospective applicants must have the following minimum experience: 1 year business systems analysis; 3 years COBOL in a maintenance environment; 1 year CICS, either COMMAND or MACRO; 2 years OS/MVS JCL on a large IBM mainframe; 2 years VM/CMS or equivalent. Additionally, candidate must have structured programming experience using thorough testing techniques, excellent communication skills, and be receptive to a team environment. Knowledge of VSAM and ALC and Insurance concepts are desirable.

### Programmer I

Will make program modifications based on user specifications, code, test document and implement changes to our existing applications systems. The following skills are required: 2 years COBOL using structured programming techniques; 1 year OS/MVS JCL on a large IBM mainframe; 1 year VM/CMS or equivalent; 6 months VSAM experience. Applicants must exhibit proficiency in testing techniques and communication skills while working in a team environment.

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Candidates should specify whether the application is for a tenurable position or a limited term position. Applicants for the former position should state whether, if they are unsuccessful in that application, they wish to be considered for the latter position. Persons able to obtain leave of absence from current employment are invited to apply. Candidates should also specify the level for which the application is made. The University would normally make an appointment at Senior Lecturer level only if no suitable appointment could be made at Lecturer level.

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Applications, containing full details of qualifications, employment history, research interests, publications list, and the names and addresses of three referees, should reach the University Secretary, The University of Wollongong, P.O. Box 1144, Wollongong, N.S.W. 2500, Australia by 5 October 1984. Please mark envelope 'Confidential - Appointment'.

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At least five to six years experience required with computerized systems including 2 years IDMS physical and logical data base design, installation and maintenance of IDMS related products. IMS and CICS experience a plus. BSCS, BSBA or Math Degree or equivalent experience required.

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At least four to six years data processing experience of which 2 years must be in UNIX (Berkley version) and/or VMS Systems Programming using C language. BSCS or EE Degree or equivalent experience required.

### PROGRAMMER/ANALYST I

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### PROGRAMMER/ANALYST III

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### SYSTEMS PROGRAMMER

At least four to six years data processing experience with one or more years experience in VM and MVS. Knowledge of assembler VM/MVS, SMP4 and MVS essential. Current hardware is 3083 and 4341 with plans for IBM 3081 and 4381. BSCS or equivalent experience.

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### COORDINATOR FOR ADMINISTRATIVE COMPUTER SERVICES Union College of New York

The Office of Computer Services is seeking an Administrative Services Coordinator, one of three senior positions in the department. The successful candidate will have 3-5 years of data processing project management experience, a proven ability to work with individuals and groups, and very good communication skills.

The Coordinator is responsible for all administrative software and services, and oversees the activities of programming project teams involved in software development and maintenance.

Union College is a highly selective independent residential college of about 2,000 undergraduates, offering liberal arts, engineering and computer science curricula along with a small graduate program.

The College is located in New York State's Capital District Area near the Adirondacks, and the region offers a wide variety of educational, cultural and recreational opportunities.

The position is available November 1. Special consideration will be given to candidates with any of the following: an advanced degree in an appropriate discipline, expertise with the HP3000 computer system, or management experience in an academic environment. The College encourages applications from women and minority group members. Salary \$27,000 to \$29,000 DOE; fringe benefits generous. Write, including full resume plus contact information for three references, no later than October 5 to:

**Wayne E. Holt**  
Director of Computer Services  
Union College  
Schenectady NY 12308

### PROJECT SUPERVISOR

Tropicana, a major division of the Beatrice companies and America's leading brand of 100% pure Florida orange juice, has an expansion opening for a high calibre individual with 3-5 years experience in a Systems Development capacity.

Practical knowledge of Systems Development Methodologies, Data Communications, Database, COBOL, and related large systems concepts are a must; as well as the ability to manage a project from conception to completion. Experience with a large accounting firm or manufacturing environment a plus. MBA preferred.

In return, we offer career opportunities coupled with an excellent compensation and benefits package.

Send resume and salary history to: Bill Baum, Dept # 2469

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Possession of an earned Ph.D. in computer science or related field is required. Initial appointment is normally three years now open. Primary responsibility will be teaching computer science courses. Salary commensurate with overall experience. Address inquiries to: Chairman, Computer Science Department, U.S. Naval Academy, Annapolis, MD 21402. Phone (301) 267-2797. Deadline for receipt of application (resume and three letters of reference) is December 1, 1984. Applications will be considered until the position is filled. An equal opportunity/affirmative action employer.

#### Coordinator Of Academic Computing

The College Of Saint Katherine, a four year, liberal arts college for women, is seeking a Coordinator of Academic Computing for its newly established computer center. This individual will plan, coordinate, budget and administer the growth of the academic computing program throughout the community, including the on-going selection and installation of software and hardware. Additional duties are to provide periodic faculty workshops, disseminate current information, and assist faculty in evaluation and use of hardware and software. Will supervise the academic VAX 11/780, micro-16, terminal rooms, systems analysts and student consultant staff.

Qualifications include a B.S. Degree in Math, Computer Science or related field with two or three years as a coordinator/analyst; graduate degree in any discipline and formal computer science training preferred. Demonstrated knowledge of computers and their applications is required; experience in higher education preferred. Knowledge of VAX/VMS, UNIX, CP/M, and MS-DOS mini and micro operating systems is highly desirable. Knowledge of SAS, INFO, Roushchert, Math MASS-11, and other academic software tools is an added plus.

Excellent salary and benefits package. To apply send resume by October 10, 1984 to Karen Johnson, Personnel Director

**The College Of Saint Katherine**  
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data processing

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Experience with hardware/software shown below is preferred. You will also need strong interpersonal and communicating skills.

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Exciting plans in data processing require us to recruit new talented individuals who are self-motivated, innovative and technically competent to participate in application projects. Our environment includes 3 IBM 3033's, OS/MVS, and a Tandem Non-Stop II. If you are a career minded EDP professional, we have the following opportunities available:

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### SYSTEMS ANALYST

Highly experienced Systems Analyst in maintenance and development of bank/savings and loan applications required. Bachelor's degree plus financial programming experience highly preferred.

### APPLICATIONS PROGRAMMER

Minimum of two years programming experience utilizing NCR Neat 3 on financial applications such as DDA, ATM, Savings, Loan Tracking and General Ledger systems. Bachelor's degree preferred.

In addition to top salaries in the industry, we offer excellent opportunities for professional growth, relocation expenses, dental, medical and life insurance, discount loans and flexible working hours.

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County of San Mateo, Redwood City, California. Newly-established position reporting to the County Manager and responsible for the development, planning, and implementation of integrated, County-wide automated information systems utilizing existing IBM 4341 mainframe and developing a comprehensive strategy for meeting future data processing needs of the County. Requires college degree or equivalent and significant technical and administrative experience in the development and implementation of state-of-the-art, government-oriented, automated information systems. Salary open, depending upon qualifications. Submit resume (including current salary and work-related references) by October 5, 1984, to:

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### SYSTEMS PROGRAMMER DEC/RSTS

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Should have professional certification and B.S. in Computer Science or business related field with minimum of three years EDP Audit experience in an MVS environment utilizing ACF2, TSO, ROSCOE, CICS and IDMS.

Please mail resume and salary requirements to the Employee Relations Department. Principals only.



### Central and South West Corporation

P.O. Box 220164 • Dallas, Texas 75222

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We need Senior Programmer/Analysts and Designers for our Branch Delivery and ATM Systems. Individuals will work in an MVS environment with multiple 300's utilizing IMS DB/DC. Interfacing with the host are TANDEM TXP's and a Branch Delivery System utilizing IBM 4700 Controllers. These positions require development experience in any of the following:

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- IMS DB/DC USING COBOL

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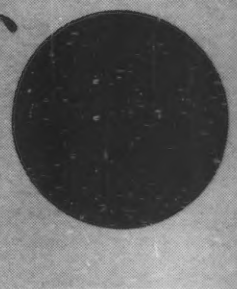
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We are seeking an individual experienced in IBM S/36 to operate, monitor and control computer functions using operators manuals and job run instructions. Will determine and execute sequences of operations, maintain control logs, and resolve error conditions. Minimum 6 months experience required. Further advancement into programming or operations supervision possible. Rotating schedule including weekends.

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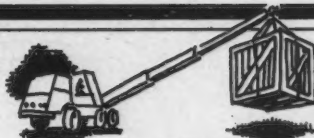
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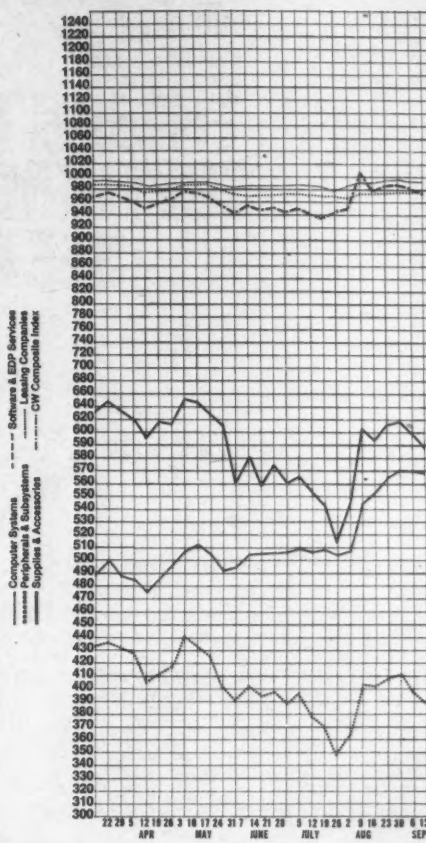
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## Computerworld Stock Trading Index



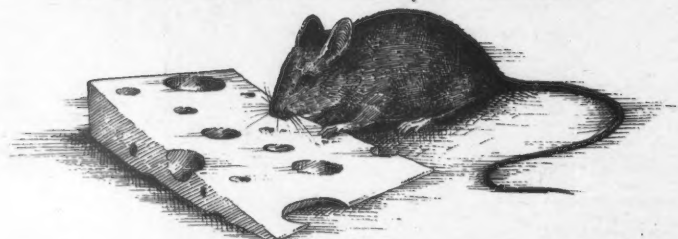
## Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPTEMBER 12, 1984

All statistics compiled,  
computed and formatted  
by  
TRADE QUOTES, INC.  
Cambridge, Mass. 02139

E N C	1983-84 RANGE	CLOSE SEP 12 1984	PRICE		HIGH NET CHANGE	LOW NET CHANGE	PCT CHANGE	E N C	1983-84 RANGE	CLOSE SEP 12 1984	PRICE		HIGH NET CHANGE	LOW NET CHANGE	PCT CHANGE	E N C	1983-84 RANGE	CLOSE SEP 12 1984	PRICE		HIGH NET CHANGE	LOW NET CHANGE	PCT CHANGE	
			1983-84 RANGE	1984							1983-84 RANGE	1984							1983-84 RANGE	1984				
COMPUTER SYSTEMS																								
D	ALPHA MICROSYSTEMS	8-24	8	-1	-10.0			D	ADVANCED CORP TECH	3-8	3 3/4	+1/4	+7.1			D	COMPUTER DEVICES INC	1-1	1 1/8	0	0.0			
A	ALTO CORP	8-21	10	0	0.0			N	ADVANCED SYSTEMS INC	14-22	17 1/4	-1/2	-2.8			D	COMPUTER TRANSFER	2-10	1 3/4	0	0.0			
A	ANALOG CORP	10-20	12 3/8	+1/2	+4.2			N	AGE COMPUTER INC	11-22	13 3/4	0	0.0			N	COMPUTERVISION CORP	20-30	42 7/8	+2 5/8	+6.2			
A	APPLE COMPUTER INC	18-32	28 1/8	0	-0.4			N	AMERICAN SOFTWARE	13-31	18	+1/4	+1.9			N	CONACORP	11-24	13 1/2	+1/4	+1.8			
N	AT&T	15-21	18 1/8	0	0.0			N	ANACOM INC	2-18	2 3/8	+1/4	+11.7			N	DATAPRODUCTS CORP	18-22	22 7/8	+1/8	+0.5			
N	BURROUGHS CORP	44-58	52 1/2	-1	-1.8			N	ANALYSTS INTL CORP	13-17	5 1/4	0	0.0			N	DATARAM CORP	9-12	9 1/8	0	0.0			
N	COMPUTER INFORMATION	28-32	30 1/2	+7/8	+2.8			N	APPLIED DATA RES.	18-27	24 1/8	-3/8	-2.8			N	DATA SWITCH CORP	8-11	12 1/8	+1/4	+2.1			
N	COMPUTER CONSOLES	14-28	18 7/8	-7/8	-4.8			N	ARK COMPUTER SYSTEMS	13-21	17 1/4	-1 1/4	-6.7			N	DATUM INC	8-17	8 3/8	+3/8	+6.2			
N	CONTROL DATA CORP	27-38	34 1/4	-1 1/2	-2.8			N	ASTRAPHIC CORP INTL	1-7	2	+1/8	+6.8			N	DECISION DATA COMPUT	8-18	12 1/8	-1/4	-2.1			
N	CONVERSANT TECH	10-11	11 1/2	+1/2	+2.4			N	ATMATIC DATA PROC	30-44	38 3/8	-1/2	-1.3			N	DECEIVE-OLIVETTI	9-38	3 1/4	-1	-18.0			
N	CRAY RESEARCH INC	28-38	34 3/8	-2	-3.5			N	CON COMPUTER ASSOC	8-17	12	+1/8	+1.9			N	ELECTRONIC R & R	9-11	3 3/8	0	0.0			
N	DATA GENERAL CORP	27-38	34 1/4	-1 1/2	-2.8			N	COMPUTER ASSOC INTL	15-20	17 1/2	-1/2	-2.7			N	ENDATA INC	8-18	8	-1/4	-3.0			
N	DATAPoint CORP	15-21	14 3/4	-1 1/8	-8.8			N	COMPUTER HORIZONS	8-20	8	-1/8	-2.0			N	EVANS & SUTHERLAND	13-20	20	-1/4	-1.2			
N	DIGITAL EQUIPMENT	14-22	20 1/4	+1/2	+1.3			N	COMPUTER NETWORKS	9-11	9 1/8	+1/8	+2.3			N	GAMMALP TECHNOLOGIES	3-14	12 1/8	-1/8	-0.8			
N	DEC INC	12-18	13 1/4	-3/8	-2.7			N	COMPUTER SCIENCES	11-23	14 3/8	+1/8	+1.7			N	GEN'L DATA CORP INTL	10-20	18 7/8	-1 1/8	-5.8			
N	ELECTRONIC ASSOC	15-21	14 3/4	-1 1/8	-8.8			N	COMPUTER TAGE GROUP	12-18	18 1/4	+1/4	+2.0			N	GREAT SOUTHWEST INTL	1-3	3 1/2	0	0.0			
N	FLOPPING POINT SYST	13-44	17 1/4	-3/8	-2.4			N	COMPUTER USAGE	8-18	11	-3/8	-3.3			N	HAZELTINE CORP	18-33	30 3/4	-2	-6.1			
N	FOUNDER	22-32	30 3/4	-1	-3.2			N	COMPUTER SYSTEMS	6-23	4 3/4	0	0.0			N	SCOT CORP	2-8	2	-1/4	-12.5			
N	GENERAL AUTOMATION	7-18	7 7/8	0	0.0			N	CONSERV CORP	1-18	2 3/8	0	0.0			N	INFORMATION INTL INC	10-19	10 3/4	-1/4	-2.2			
N	GOLD INC	24-44	25 7/8	-4 3/4	-19.5			N	CONVARE	7-14	8	-1/4	-3.0			N	INTEL CORP	27-45	33 3/4	-3/4	-2.1			
N	HARRIS CORP	23-48	28 1/4	-3/8	-1.2			N	COULINET SOFTWARE	24-30	44 1/2	+3/4	+1.7			N	LUNBY ELECTRONICS	7-18	8 3/4	+1/4	+2.8			
N	HOLLEY-PACIFIC CO	31-48	37 3/8	-1	-2.5			N	CYCLONE SYSTEMS INC	18-20	20 3/8	+3/8	+1.8			N	RESADATA CORP	8-15	12 1/2	+1 1/8	+9.0			
N	HONEYWELL INC	48-68	58 1/8	-3 7/8	-6.1			N	ELECTRONIC DATA SYST	25-45	45 3/8	+1/4	+0.8			N	RBI DATA CORP	8-25	9 1/4	-1 1/8	-10.8			
N	IBM	100-124	122 3/8	+1/2	+0.4			N	EGOM SYSTEM INC	10-27	13 1/4	-1/8	-0.8			N	SHARP CORP	18-28	25 5/8	-3/4	-2.5			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	GENERAL ELECTRIC CO	45-58	57 1/8	+7/8	+1.5			N	SIEMENS CORP	18-24	24	-1	-4.3			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ITE CORP	26-48	38 3/4	+1/8	+0.3			N	HO AMERICAN PHILIPS	30-40	38 3/8	-3/4	-1.9			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	INFORMATICS GENERAL	15-32	18 1/2	-1 1/2	-8.3			N	NORTHERN TELECOM LTD	30-48	38 1/8	-2 1/2	-6.1			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	INFORMATION RESEARCH	24-42	28	-1/2	-1.7			N	ONE	1-8	8	0	0.0			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	KEANE ASSOCIATES	8-12	12	0	0.0			N	PANADAY CORP	12-26	13 7/8	-1/8	-0.8			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	LOUISIANA	18-21	21 1/2	-7/8	-3.8			N	PERMIL CORP	8-17	12 5/8	-1	-7.3			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	NCI COMMUNICATIONS	6-28	7 3/8	-1/8	-1.8			N	PHOENIX AMERICAN INC	8-17	7 1/8	-3/8	-5.0			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	PHOT SCI INC	11-23	13 3/4	-1	-7.8			N	PLESLEY CO (ARR)	25-41	29 1/4	-1 1/2	-5.8			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	NUMERICAL ANALY APP	6-18	8 1/2	0	0.0			N	PRINTWIRE INC	18-34	21	-1 1/2	-6.8			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	RANTEX CORP	8-23	8 3/4	-1/4	-3.3			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	RECONITION EQUIP	10-17	14 3/8	+1/2	+3.4			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	ROPER CORP	30-40	45 1/2	+5/8	+1.3			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	SCAR-TROM CORP	6-18	10 1/2	-2	-19.3			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	SCIENTIFIC ATLANTA	8-23	8 3/4	+1/2	+5.8			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	STORAGE TECHNOLOGY	7-23	11 1/8	-1/4	-2.1			
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N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	TECH PRODUCTS CO	12-20	12 3/4	-3/8	-2.1			
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N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	TELETYPE INC	8-12	10 3/8	+5/8	+5.8			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	TELETYPE INC	8-12	10 3/8	+5/8	+5.8			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	TELETYPE INC	8-12	10 3/8	+5/8	+5.8			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	TELETYPE INC	8-12	10 3/8	+5/8	+5.8			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	TELETYPE INC	8-12	10 3/8	+5/8	+5.8			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	TELETYPE INC	8-12	10 3/8	+5/8	+5.8			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	TELETYPE INC	8-12	10 3/8	+5/8	+5.8			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	TELETYPE INC	8-12	10 3/8	+5/8	+5.8			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	TELETYPE INC	8-12	10 3/8	+5/8	+5.8			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	TELETYPE INC	8-12	10 3/8	+5/8	+5.8			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	TELETYPE INC	8-12	10 3/8	+5/8	+5.8			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	TELETYPE INC	8-12	10 3/8	+5/8	+5.8			
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N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	TELETYPE INC	8-12	10 3/8	+5/8	+5.8			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	TELETYPE INC	8-12	10 3/8	+5/8	+5.8			
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N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	TELETYPE INC	8-12	10 3/8	+5/8	+5.8			
N	IBM CORP INC	3-14	3 1/4	+1/4	+6.3			N	ORION SYSTEMS INC	6-18	8 1/2	0	0.0			N	TELETYPE INC	8-12	10 3/8	+5/8	+5.8			
N	IBM CORP INC	3-14	3 1/4																					

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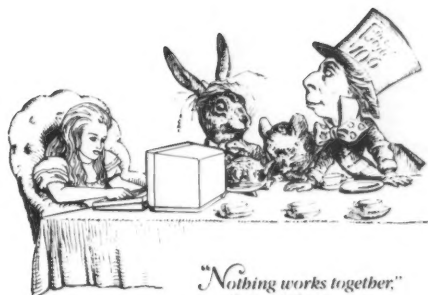


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